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Vol. 961 Number 5

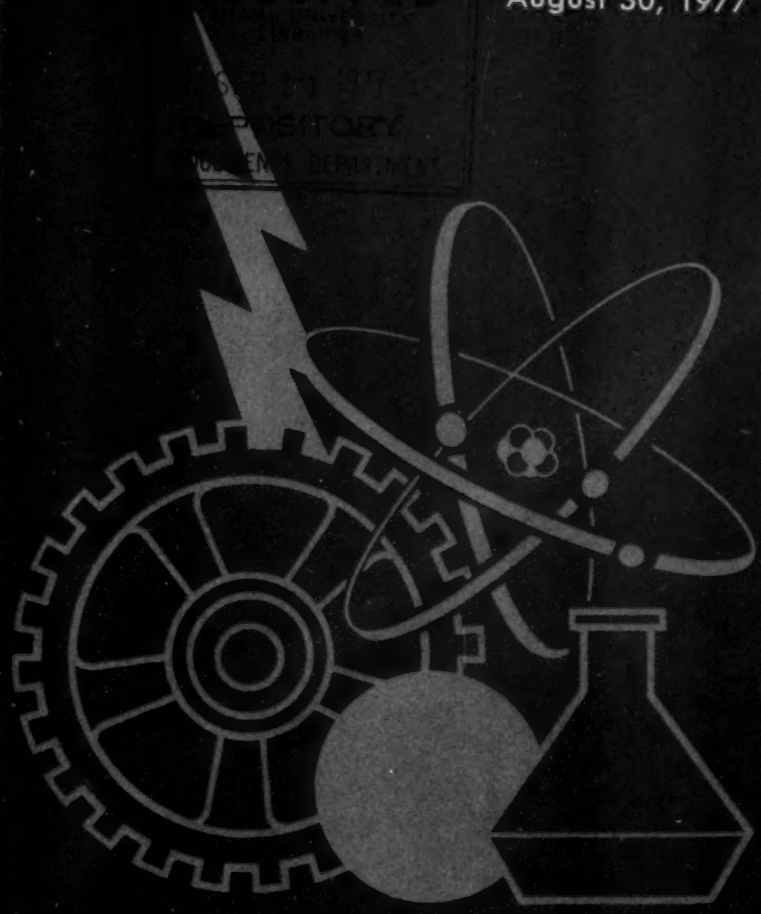
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 30, 1977



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 30, 1977 Volume 961 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

United States Patent and Trademark Office Before the Commissioner of Patents and Trademarks

IN RE LEWIS A. PALEY, RESPONDENT. PROCEEDING FOR SUSPENSION OR DISBARMENT

Final Order

Lewis A. Paley of Aurora, Illinois, whose registration number is 11,294, is hereby suspended for a two-year period, beginning with the date of this order from practice as a Patent Agent in applications before the United States Patent and Trademark Office, without prejudice to his re-registration thereafter upon a sufficient showing.

This action is taken under the provisions of Section 32 to Title 35, U.S. Code, and Section 1.348, Title 37, of the Code of Federal Regulations.

Dated: Feb. 16. 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Board of Appeals Decisions Rendered in the Month of July 1977

Affirmed	214
Affirmed in Part	31
Reversed	74
Total	319

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,032,345, J. H. Lemelson, TARGET GAME; **3,917,271,** Lemelson and Elfman, BALL FOR TARGET GAMES, **filed** Mar. 30, 1977, D.C., S.D.N.Y., Doc. 77–C–1515, *Synergistics Research Corporation and Jerome H. Lemelson* v. *Franki Toy Company et al.*

3,146,709, Bass and Kirby, METHOD AND APPARATUS FOR MOUNTING PRINTING SLEEVES, **filed** June 17, 1976, D.C.N.J. (Newark) Doc. 76–1163, *Mosstype Corporation* v. *West Essex Printing Plates, Inc.* Judgment declaring patent not infringed, and dismissing counterclaim, June 21, 1976.

3,232,162, M. Kitchum, BLIND LOCKED SPINDLE RIVET AND METHOD FOR APPLYING THE SAME, **filed** Apr. 14, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1252, *Textron, Inc.* v. *The Milford Rivet & Machine Co.*

3,259,291, J. A. Maurer, MOTION PICTURE PROJECTOR WITH AUTOMATIC EDGEWISE FILM THREADING, **filed** Apr. 14, 1977, D.C., S.D.N.Y., Doc. 77–C–1802, *Bell & Howell Co.* v. *McGraw-Hill Inc.*

3,307,308, W. C. Lyons, PRECAST SUB-GRADE REINFORCED CONCRETE STAIRWAY, **filed** Mar. 25, 1977, D.C. Mass. (Boston) Doc. 77–864–T, *The Bilco Company and The Permentry Company* v. *Shawnee Precast Products, Inc.*

3,307,671, J. R. Shirley, COIN CONTROLLED MEANS; **3,820,642,** J. L. Levasseur, VEND CONTROL CIRCUIT WITH IMPROVED DEPOSIT REFUND AND ACCUMULATION MEANS; **3,828,903,** same, VEND CONTROL WITH ESCROW UNTIL AVAILABLE PRODUCT SELECTION; **3,829,634,** same, SLIDE SWITCH ASSEMBLY HAVING PIGGYBACK MULTIPLE ACTUATORS EXTENDING THROUGH COMMON COVER APERTURE; **3,963,035,** same, COIN CONTROLLED CIRCUITS FOR VENDING AND OTHER COIN CONTROLLED DEVICES, **filed** Jan. 24, 1977, D.C., N.D. Tex. (Dallas), Doc. CA3–77–0100–D, *H. R. Electronics Co.* v. *UMC Industries, Inc., doing business as National Rejectors Industries, a division of UMC Industries, Inc.*

3,374,844, E. L. Rogers, APPARATUS AND METHOD FOR WEIGHING RAILROAD CARS IN MOTION, **filed** Apr. 21, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1379, *Railweight, Inc.* v. *Mangood Corporation.*

3,482,372, W. J. Hottendorf, METHOD AND APPARATUS FOR PACKAGING CONTAINERS, **filed** Mar. 27, 1973, D.C. Del. (Wilmington) Doc. 4617, *International Paper Company* v. *Fibreboard Corporation.* This action is dismissed with prejudice, Mar. 29, 1977.

3,546,478, J. M. Lindsey, BOREHOLE TOOL, **filed** Apr. 11, 1977, D.C., S.D. Tex. (Houston) Doc. CA H–77–568, *Sperry-Sun Well Surveying Co.* v. *Eastman Whipstock, Inc.*

3,619,381, G. R. Fitterer, DETERMINING OXYGEN CONTENT OF MATERIALS; **3,752,753,** same, METHOD OF FABRICATING A SENSOR FOR THE DETERMINATION OF THE OXYGEN CONTENT OF LIQUID METALS; **3,733,641,** same, MEANS FOR DETERMINING OXYGEN CONTENT OF LIQUID METALS, **filed** Dec. 6, 1976, D.C., W.D. Pa. (Pittsburgh) Doc. 76–1250, *Fitterer Engineering Assoc., etc.* v. *Electro-Nite Co.* Defendant is not to infringe on plaintiff's patents, Apr. 21, 1977.

3,647,990, Eul, Jr. and Richter, DEMAGNETIZER/CLEANER, **filed** Apr. 13, 1977, D.C., E.D.N.Y. (Brooklyn) Doc. 77–C–707, *Ampex Corporation* v. *Robins Industries Corporation.*

3,736,584, Hackett and Goble, MOTION DETECTOR AND INTRUDER ALARM SYSTEM, **filed** Apr. 13, 1977, D.C., W.D.N.Y. (Buffalo) Doc. C–77–169, *Detection Systems, Inc.* v. *Pittway Corporation.*

3,746,518, F. C. Holtz, Jr., ALLOY COMPOSITION AND PROCESS, **filed** Apr. 8, 1977, D.C., S.D.N.Y., Doc. 77–C–1706, *Stora Kopparberg Corporation* v. *C. Marshall Dann, Commissioner of Patents and Trademarks.*

3,752,753. (See 3,619,381.)

3,773,641. (See 3,619,381.)

3,792,133, R. R. Goughnour, METHOD FOR SLIP-FORMING WALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION; **3,957,405,** same, SLIP FORM HAVING HINGED GATE MEANS; **4,014,633,** same, ADJUSTABLE SLIP FORM, **filed** Apr. 18, 1977, D.C., N.D. Ga. (Atlanta) Doc. C77–604, *A. C. Aukerman Co.* v. *Pittman Highway Contracting Co., Inc.*

3,811,780, M. D. Liston, CHEMICAL ANALYSIS CUVETTE, **filed** Aug. 29, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c2911, *Abbott Laboratories* v. *Robert A. Stough & Company, Inc.* Defendant is hereby permanently restrained and enjoined from directly or indirectly infringing said patent, Mar. 4, 1977. **Same, filed** Mar. 11, 1977, D.C. Conn. (Bridgeport) Doc. B–77–76, *Centaur Chemical Co.* v. *Abbott Laboratories.*

3,815,285, H. S. Kuyper, COVERED WINDOW SASH AND METHOD FOR MAKING THE SAME, **filed** Oct. 15, 1975, D.C., W.D.N.Y. (Buffalo) Doc. 75–436, *Rolscreen Company* v. *King Bros. Wholesale Co., Inc. et al.* Consent decree and permanent injunction and order of dismissal as to certain defendants, Oct. 27, 1976.

3,818,198, Walker and Maloy, AUTOMATIC DIRECT-READING PHOTOMETER APPARATUS AND METHOD, **filed** Apr. 12, 1977, D.C., S.D. Calif. (San Diego) Doc. 77–0234–T, *Gamma Scientific, Inc.* v. *Kollmorgen Technologies Corporation.*

3,820,642. (See 3,307,671.)

3,828,903. (See 3,307,671.)

3,829,634. (See 3,307,671.)

3,913,744, Turner and Thomas, LUMBER SORTER APPARATUS, **filed** Apr. 15, 1977, D.C. Oreg. (Portland) Doc. C–77–324, *Donald B. Turner et al.* v. *U.S. Natural Resources, Inc.*

3,917,271. (See 3,032,345.)

3,957,405. (See 3,792,133.)

3,963,035. (See 3,307,671.)

3,999,532, W. H. Huggins, EPILATOR, **filed** Feb. 10, 1977, D.C., S.D.N.Y., Doc. 77–C–0685, *Depilatron, Inc.* v. *Individually Yours, Inc. and Individually Yours, International, Ltd.* **Same, filed** Mar. 29, 1977, D.C. Conn. (Bridgeport) Doc. B–77–112, *Epilator Corporation* v. *Universal Technology, Inc. and Depilatron, Inc.*

4,014,633. (See 3,792,133.)

D. 215,979, H. P. Post, DISPLAY CABINET FOR MERCHANDISE, **filed** Mar. 7, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c763, *M.G. Design Associates, Inc.* v. *Display Workshop, Inc.*

D. 231,758, A. Rosselli, COUCH; **D. 231,759,** same, ARMCHAIR, **filed** Apr. 6, 1977, D.C., S.D.N.Y., Doc. 77-C-1633 CBM, *Industria Arredamenti Fratelli Saporiti* v. *Eros Leather Furniture Corp.*

D. 231,759. (See D. 231,758.)

D. 234,727, R. Mark, COSMETIC VANITY CONTAINER, **filed** Apr. 20, 1977, D.C., E.D.N.Y. (Brooklyn) Doc. 77-C-834, *Harbor Trading Company* v. *Cosmepak, Inc.*

D. 243,032, D. R. Hodges, PLANTER, **filed** Apr. 29, 1977, D.C. N.D. Tex. (Dallas) Doc. CA3-77-0595-D, *Fitz and Floyd, Inc.* v. *The Whittier Potteries, Inc. and Jack Manes Associates.*

D. 243,217, E. E. Warsaw, SOFA, **filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-998-DWW, *Sheffield Furniture Corp.* v. *Bailey Schmitz.* **Same, filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV-77-999-WPG, *Sheffield Furniture Corp.* v. *Brand Furniture Manufacturing Co.* **Same, filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1000-LTL, *Sheffield Furniture Corp.* v. *Cal Custom Furniture Mfg.* **Same, filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1001-HP, *Sheffield Furniture Corp.* v. *Cal-Pacific Furniture.* **Same, filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1003-R, *Sheffield Furniture Corp.* v. *Charm Furniture Mfg. Corp.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1006-LEW, *Sheffield Furniture Corp.* v. *Cims Furniture & Cabinet Mfg.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV-77-1007-HP, *Sheffield Furniture Corp.* v. *Claridge Furniture Mfg. Co., Inc.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1008-RF, *Sheffield Furniture Corp.* v. *Coleman of California.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1009-R, *Sheffield Furniture Corp.* v. *De Ville Furniture Mfg. Co., Inc.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1010-MML, *Sheffield Furniture Corp.* v. *Fedco, Inc.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc.CV77-1011-AAH, *Sheffield Furniture Corp.* v. *Furniture Guild.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1012-RJK, *Sheffield Furniture Corp.* v. *R.B. Furniture.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1013-FW, *Sheffield Furniture Corp.* v. *Riviera Convertibles.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1014-WPG, *Sheffield Furniture Corp.* v. *Royal Pacific Furniture Mfg. Co.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1015-AAH, *Sheffield Furniture Corp.* v. *Shelly & Anderson Furniture Mfg. Co.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1016-RF, *Sheffield Furniture Corp.* v. *Sofa Line.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1017-RMT, *Sheffield Furniture Corp.* v. *Sofas Unlimited.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1020-WPG, *Sheffield Furniture Corp.* v. *Town House Mfg. Co.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1021-HP, *Sheffield Furniture Corp.* v. *William Volker & Co.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1022-LTL, *Sheffield Furniture Corp.* v. *B. P. John Furniture.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1023-WMB, *Sheffield Furniture Corp.* v. *Style Crest of California.* **Same, filed** Mar. 22, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1039-IH, *Sheffield Furniture Corp.* v. *Capitol Furniture.* **Same, filed** Mar. 31, 1977, D.C. Ariz. (Phoenix) Doc. C-77-258 Phx, *Sheffield Furniture Corp.* v. *Lunn Furniture Mfg. Co.* **Same, filed** Mar. 31, 1977, D.C. Ariz. (Phoenix) Doc. C-77-259 Phx, *Sheffield Furniture Corp.* v. *Richardson Furniture Mfg. Co.* **Same, filed** Mar. 31, 1977, D.C. Ariz. (Phoenix) Doc. C-77-260 Phx, *Sheffield Furniture Corp.* v. *Continental Mfg. Co.* **Same, filed** Apr. 6, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1157, *Sheffield Furniture Corp.* v. *Covington Furniture.* **Same, filed** Apr. 6, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1158, *Sheffield Furniture Corp.* v. *Kingsley Manufacturing Co.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,526,001, Re. S.N. 810,007, Filed June 24, 1977, Cl. 210/23, PERMEATION SEPARATION DEVICE FOR SEPARATING FLUIDS AND PROCESS RELATING THERETO, William G. Smith, Owner of Record: *E. I. Du Pont De Nemours and Company, Wilmington, Del.,* Attorney or Agent: Gary A. Samuels, Ex. Gp.: 176

3,660,344, Re. S.N. 813,415, Filed July 6, 1977, Cl. 260/37 N, SELF-EXTINGUISHING POLYAMIDE MOULDING COMPOSITIONS, Dietrich Michael, et al., Owner of Record: *Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Allan R. Plumley, et al., Ex. Gp.: 141

3,820,083, Re. S.N. 813,402, Filed July 5, 1977, Cl. 340/172.5, CODED DATA ENHANCER, SYNCHRONIZER, AND PARITY REMOVER SYSTEMS, John L. Way, Owner of Record: *Bell & Howell Company, Chicago, Ill.,* Attorney or Agent: Luc P. Benoit, Ex. Gp.: 237

3,892,062, Re. S.N. 812,411, Filed July 1, 1977, Cl. 57/34 R, APPARATUS AND METHOD FOR START-SPINNING ON AN OPEN-END SPINNING MACHINE, Fritz Stahlecker, et al., Owner of Record: *Inventors,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 244

3,926,411, Re. S.N. 812,468, Filed July 1, 1977, Cl. 254/89 R, LIFTING JACK, Sheldon D. Tegtmeier, Owner of Record: *Tegtmeier & Sons, Inc., West Fargo, N. Dak.,* Attorney or Agent: John W. Adams, Ex. Gp.: 323

PATENT NOTICES

Certificates of Correction for the Week of Aug. 30, 1977

D. 243,899	4,000,541	4,019,692	4,024,515
D. 244,519	4,001,263	4,019,861	4,024,689
3,681,299	4,002,304	4,019,962	4,025,303
3,728,382	4,002,305	4,019,995	4,025,311
3,734,919	4,003,518	4,020,150	4,025,315
3,764,869	4,003,557	4,020,227	4,025,393
3,786,195	4,003,866	4,020,233	4,025,413
3,796,743	4,004,233	4,020,919	4,025,628
3,798,116	4,004,526	4,020,929	4,025,706
3,815,698	4,004,799	4,021,069	4,025,716
3,852,642	4,006,149	4,021,240	4,025,738
3,875,004	4,006,231	4,021,275	4,025,756
3,876,544	4,006,292	4,021,310	4,025,773
3,909,209	4,006,672	4,021,376	4,025,789
3,923,740	4,007,045	4,021,591	4,026,100
3,928,911	4,007,524	4,021,592	4,026,141
3,939,189	4,009,866	4,021,625	4,026,351
3,940,541	4,011,249	4,021,642	4,026,659
3,947,714	4,013,120	4,022,411	4,026,685
3,954,161	4,013,813	4,022,448	4,026,812
3,955,659	4,013,840	4,022,716	4,026,860
3,957,992	4,014,242	4,022,778	4,026,934
3,966,880	4,014,915	4,022,851	4,026,973
3,976,158	4,015,218	4,022,912	4,027,008
3,976,198	4,016,263	4,022,996	4,027,037
3,977,310	4,016,846	4,023,009	4,027,038
3,978,529	4,017,024	4,023,027	4,027,219
3,979,481	4,017,388	4,023,046	4,027,226
3,982,622	4,017,453	4,023,083	4,027,278
3,983,385	4,017,716	4,023,139	4,027,850
3,987,117	4,017,784	4,023,228	4,027,952
3,990,776	4,018,048	4,023,308	4,028,128
3,991,187	4,018,158	4,023,315	4,028,179
3,992,527	4,018,613	4,023,463	4,028,204
3,992,552	4,018,716	4,023,586	4,028,226
3,995,033	4,018,774	4,023,877	4,028,418
3,995,256	4,018,865	4,023,898	4,028,440
3,995,668	4,018,946	4,024,032	4,028,537
3,995,981	4,018,965	4,024,082	4,028,629
3,996,285	4,019,069	4,024,093	4,029,214
3,996,410	4,019,206	4,024,135	4,030,023
3,996,515	4,019,325	4,024,186	4,030,069
3,996,847	4,019,423	4,024,260	4,030,071
3,999,004	4,019,662	4,024,385	4,035,568

Disclaimer

3,885,630.—*Edwin A. Richardson,* Houston, Tex. BUFFER-REGULATER CARBONATE ACIDIZATION. Patent dated May 27, 1975. Disclaimer filed July 5, 1977, by the assignee, *Shell Oil Company.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimers and Dedications

3,754,737.—*John A. O'Dea,* Columbus, Ohio. DIRECT GEAR DRIVE FOR TRUCK MIXER DRUM. Patent dated Aug. 28, 1973. Disclaimer and dedication filed May 15, 1977, by the assignee, *Fairfield Manufacturing Company, Inc.*

Hereby disclaims and dedicates to the Public claims 1–16 of said patent.

3,912,258.—*Merrill D. Martin,* Oakland, Calif. CONVEYOR SYSTEM FOR CONVEYING SHEETS. Patent dated Oct. 14, 1975. Disclaimer and dedication filed May 6, 1977, by the inventor.

Hereby disclaims and dedicates all claims of said patent.

Dedication

4,027,616.—*Robert O. Guenther,* Irving, *Donald F. Huffhines,* Richardson, *James W. Krall,* Irving, and *Charles D. Ray,* Dallas, Tex. PROTECTION MEANS FOR DEPTH CONTROL DEVICE. Patent dated June 7, 1977. Dedication filed July 14, 1977, by the assignee, *Mobil Oil Corporation.*

Hereby dedicates to the Public the entire term of said patent.

Patents Available for Licensing or Sale

3,028,828. FLOTATION DEVICE FOR SHIPS. Joseph Girolame, 10 Helen St., Johnson City, N.Y. 13790.

3,482,418. FOOD STORAGE APPARATUS. Georgia Lee Moore, P.O. Box 21425, Houston, Tex. 77026.

3,511,338. LADDER STAND WITH AUXILIARY PLATFORM. Edwin H. Chapman, West Union, W. Va., % C & S Sales Co., 101 Neely Ave., West Union, W. Va. 26456.

3,589,717. BICYCLE-SUPPORTING STAND FOR EXERCISING. Charles M. Alexander, 937 B. Joyce St., SW., Atlanta, Ga. 30314.

3,605,386. FURNACE EXHAUST POLLUTION ELIMINATOR. Paul H. Brown, % J. Gibson Semmes, Esq., 3524 K St. NW., P.O. Box 3559, Washington, D.C. 20007.

3,618,059. ELECTRONIC DETECTION AND TRACING MEANS. Milton F. Allen, 2989 McCully Drive NE., Atlanta, Ga. 30345.

3,744,453. DOGGONIT. Gershon Deitch, 553 Chelsea Road, Oceanside, N.Y. 11572.

3,781,920. WATER DISCHARGE VALVE FOR TOILET BOWL. Browne Engineering Corp., John G. Leake, Trustee, Box 526, Harrisonburg, Va. 22801.

3,790,043. METHOD AND APPARATUS FOR REMOVING WRINKLES FROM SLACKS OR THE LIKE. Elmer R. Hagen, Royal Arms, Apt. #6, 230 W. Genesee St., Auburn, N.Y. 13021.

3,796,209. SPACE HEATER. Alfred Luft, 3031 Regatta Drive, Sarasota, Fla. 33581.

3,812,086. SANDWICH TOAST PRESS. Evelyn Trovinger, 1425 Lake St., Lodi, Calif. 95240.

3,820,001. TRANSISTOR POWER CONVERTER. Jan Van Valkenburg Schaefer, 2345 Sea Breeze Drive, San Diego, Calif. 92139.

3,862,719. BALL MILL FOR TREATING USED CASTING SAND. W. G. Fasse, P.O. Box K, St. Albans, Maine. 04971.

3,881,637. ONE SHOT METERING VALVE. Browne Engineering Corp., John G. Leake, Trustee, Box 526, Harrisonburg, Va. 22801.

3,883,275. MODULAR PUMP ASSEMBLY. Browne Engineering Corp., John G. Leake, Trustee, Box 526, Harrisonburg, Va. 22801.

3,893,706. CHILDREN'S RIDING TOY. Elmer R. Hagen, Royal Arms, Apt. #6, 230 W. Genesee St., Auburn, N.Y. 13021.

3,885,708. FLEXIBLE TUBE WINDING AND EMPTYING DEVICE. David W. Parry, 2390 N. Forest Road, Getzville, N.Y. 14068.

3,899,157. TACK FASTENER AND STRIPPER. Robert Thomas, 30 W. Chicago Ave., Chicago, Ill. 60610.

3,910,432. APPARATUS FOR LIFTING AND LOADING A LOAD INTO AND OUT OF A VEHICLE OR THE LIKE. Browne Engineering Corp., John G. Leake, Trustee, Box 526, Harrisonburg, Va. 22801.

3,918,071. AUTOMATIC LENS FOCUSING METHOD AND APPARATUS. Fritz Albrecht, % J. Gibson Semmes, Esq., 3524 K St. NW., Washington, D.C. 20007.

3,951,446. CAR TRUNK LITTER RECEPTACLE. Fred W. Zehnder, 590 Frederick St., Frankenmuth, Mich. 48734.

3,953,011. VEHICLE SHOCK ABSORBER. Paul M. Staehlin, 9307 McVickers A, Oak Lawn, Ill. 60453.

3,953,983. REFRIGERATION METHOD AND REFRIGERATION APPARATUS FOR CARRYING OUT THE METHOD. Ernst Sander. Correspondence to Craig Antonelli, 909 Watergate Office Bldg., 2600 Virginia Ave. NW., Washington, D.C. 20037.

3,961,386. TOILET SEAT COVER APPARATUS. Ferdinand Beno, 3548 W. 25th St., Chicago, Ill. 60623.

3,970,313. ANCESTRY (PARLOR GAME). E. A. Montemayor, 4600 45th St. NW., Washington, D.C. 20016.

3,986,934. APPARATUS FOR AEROBIC CULTIVATION OF MICROORGANISMS. Hans Muller, Zurich, Switzerland. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,987,824. WATER GLASS FILLER. Fred W. Zehnder, 590 Frederick St., Frankenmuth, Mich. 48734.

3,991,922. ABRASIVE SHEET MEASURING AND CUTTING BOARD. Mervin B. Martin, Box 408, R.D. #4, Coatsville, Pa. 19320.

3,997,966. COMBINATION NAIL CLIPPER, CLIPPING RECEPTACLE AND REMOVABLE FRONT LID. James J. A. Sartore, 128 Morris St., Albany, N.Y. 12208.

3,998,148. PRESS FOR SUGAR BEET AND SIMILAR CHIPS. Salzgitter Maschinen A.G. Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,000,594. BUILDING CONSTRUCTION MEMBER. James D. Kirk, Jr., Kirkwall Corporation, 2021 Spring Road, Oak Brook, Ill. 60521.

4,001,679. WEDGE ACTION ELECTRICAL TEST PROBE. William P. Cargile, 835 Page Mill Road, Ste. 11, Palo Alto, Calif. 94301.

4,003,160. PROCESS FOR GROWING CHLORPHYLLOSE PLANTS USING CARBON DIOXIDE AND HEAT GENERATED IN EXOTHERMIC AEROBIC FERMENTATION PROCESSES. Hans Muller, Zurich, Switzerland. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,003,722. PROCESS AND ARRANGEMENT OF THE REMOVAL OF IMPURITIES FROM GASES. Heinz Holter, Belsenstrasse 39, 439 Gladbeck, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,003,795. PROCESS FOR THE DETERMINATION OF AT LEAST ONE OF THE ISOENZYMES OF LACTATEND-DEHYDROGENASE. Kommanditgesellschaft Schwarzhaupt, Cologne, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,005,443. SCANNING DEVICE AND METHOD FOR AUTOMATIC FOCUSING. Fritz Albrecht, % J. Gibson Semmes, Esq., 3524 K St. NW., Washington, D.C. 20007.

4,010,510. PAINT BRUSH AND THE LIKE. George S. Belza, 22 Carney Road, Willowdale, Ontario M2M 1Tx, Canada.

4,011,851. DISTRIBUTOR ASSEMBLY FOR A VEHICLE. Eden Beutler, 4830 Zube Court, Carmichael, Calif. 95608.

4,014,194. MECHANICAL PUSH BUTTON LOCK. Susan Nilson Hartman, 20 Binnacle Hill, Oakland, Calif. 94618.

4,017,229. APPARATUS FOR UNITING CONCENTRICALLY EXTRUDED TUBULAR FILMS OF THERMOPLASTIC SYNTHETIC RESIN. Michio Dudo, Tokyo, Japan. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,017,933. TYPEBALL CLEANING APPARATUS. Raymond A. Aja and Alphonse C. Dufault, 2 Murray Road, Essex Junction, Vt. 05452.

4,018,124. AUTOMATIC GUITAR TUNER FOR ELECTRIC GUITARS. Ruperto L. Rosado, 3525 Whitney Ave., Sacramento, Calif. 95821.

4,020,530. SECURABLE MULTI-PURPOSE CLAMP AND INSERTS. James J. A. Sartore, 128 Morris St., Albany, N.Y. 12208.

4,020,854. DEVICE AND METHOD FOR PROGRAMMED HAIR COLORING. L. Caruso, 2187 Union St., San Francisco, Calif. 94123.

4,024,829. LEAKAGE WARNING DEVICE FOR PNEUMATIC TIRE. Robert Osann, Balough, Osann, Kramer, Dvorak, Genova & Traub, 55 Broad St., New York, N.Y. 10004.

4,032,099. RECLINER PLATFORM. James W. Maude, 52 Village St., Marblehead, Mass. 01945.

4,033,538. ADJUSTABLE DRIP DRY SUPPORT APPARATUS. Harold Levy, P.O. Box 600015, North Miami Beach, Fla. 33160.

The following two patents are offered by How Wachspress, Technical Director Auditac, Ltd., 1940 Washington St., San Francisco, Calif. 94109.

3,875,932. AUDIOTACTILE STIMULATION AND COMMUNICATIONS SYSTEM.

3,954,101. AUDIOTACTILE COMMUNICATION SYSTEM.

The Nedlog Company is prepared to grant non-exclusive licenses under U.S. Patent 3,528,587 for Automatic Liquid Feed Device and U.S. Patent 3,643,835 for Automatic Liquid Proportioner on reasonable terms to domestic manufacturers.

The application for licenses under the aforementioned patents may be addressed to The Nedlog Company, 3224 N. Elston Ave., Chicago, Ill. 60618.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following patents..

Inquiries respecting licenses under these patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

D244,866. INSULATOR FOR AN ANTENNA.

4,028,499. UNIVERSAL ASSIGNED NIGHT ANSWERING SYSTEM FOR EPABX.

4,028,575. ELECTRON MULTIPLIER IMAGE DISPLAY DEVICE.

4,028,582. GUIDED BEAM FLAT DISPLAY DEVICE.

4,028,586. PARABOLIC CURRENT GENERATOR.

4,028,625. SIDEBAND ANALYZER FOR AM TRANSMITTERS.

4,028,631. CURRENT AMPLIFIERS.

4,028,720. PHOTOVOLTAIC DEVICE.

4,028,724. READ/WRITE CHARACTER GENERATOR MEMORY LOADING METHOD.

4,029,501. METHOD OF PREPARING IMPROVED MAGNETIC HEAD MATERIAL.

4,029,528. METHOD OF SELECTIVELY DOPING A SEMICONDUCTOR BODY.

4,029,531. METHOD OF FORMING GROOVES IN THE (011) CRYSTALLINE DIRECTION.

4,029,542. METHOD FOR SLOPING THE SIDEWALLS OF MULTILAYER P+PN+JUNCTION MESA STRUCTURES.

4,029,594. NOVEL LIQUID CRYSTAL COMPOUNDS AND ELECTRO-OPTIC DEVICES INCORPORATING THEM.

4,029,595. NOVEL LIQUID CRYSTAL COMPOUNDS AND ELECTRO-OPTIC DEVICES INCORPORATING THEM.

4,029,971. TRI-STATE LOGIC CIRCUIT.

4,029,984. FLUORESCENT DISCHARGE COLD CATHODE FOR AN IMAGE DISPLAY DEVICE.

4,030,040. RECEIVED SIGNAL SELECTING SYSTEM.

4,030,042. FEEDBACK AMPLIFIERS.

4,030,046. PREALIGNED LASER MOUNT AND METHOD OF MAKING SAME.

4,030,048. MULTIMODE COUPLING SYSTEM INCLUDING A FUNNEL-SHAPED MULTIMODE COUPLER.

4,030,090. FLAT IMAGE DISPLAY DEVICE UTILIZING DIGITAL MODULATION.

4,030,118. COLOR ENCODING CAMERA UTILIZING COMB FILTERING FOR COLOR SIGNAL SEPARATION.

4,030,123. STYLUS ADJUSTMENT APPARATUS FOR A VIDEO DISC PLAYER.

4,030,124. VIDEO DISC PLAYBACK SYSTEM AND PICK-UP CARTRIDGE THEREFOR.

Re. 29,203. METHOD OF MAKING PHOSPHOR SCREENS.

4,021,219. METHOD OF MAKING A COMPOSITE GLASS STRUCTURE.

4,021,375. METHOD OF FABRICATING POLYCRYSTALLINE SELENIUM IMAGING DEVICES.

4,021,588. METHOD FOR PREPARING FILTER-COATED PHOSPHOR PARTICLES.

4,021,615. APPARATUS FOR CONSERVING ENERGY IN A BUILDING.

4,021,620. MULTIFREQUENCY SIGNAL RECEIVER WITH DIGITAL TONE RECEIVER.

4,021,686. FLIP-FLOP WITH SETTING AND SENSING CIRCUITRY.

4,021,722. TEMPERATURE - SENSITIVE CURRENT DIVIDER.

4,021,750. BROAD-BAND TRAPATT AMPLIFIER HAVING A TAPERED IDLER CIRCUIT.

4,021,757. PHASE LOCK-LOOP MODULATOR USING AN ARITHMETIC SYNTHESIZER.

4,021,820. LIGHTHOUSE HAVING A MAIN FILTER AND A SUPPLEMENTAL FILTER.

4,021,839. DIODE PACKAGE.

4,021,852. SIGNAL DEFECT COMPENSATION.

4,021,945. LIQUID CRYSTAL DEVICE WITH LOUVER MEANS LOCATED BEHIND THE LIQUID CRYSTAL DEVICE.

4,022,533. LASER ALIGNMENT APPARATUS AND METHOD WITH AN ALIGNMENT MIRROR.

4,022,618. METHOD FOR DESENSITIZING RECORDED ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIA.

4,022,968. RECORDING APPARATUS AND METHODS FOR USE IN FORMING A VIDEO DISC RECORD HAVING SPIRALLY ALIGNED SYNC STORAGE LOCATIONS.

4,023,049. GTO SWITCHING CIRCUITS.

4,023,062. LOW BEAM DIVERGENCE LIGHT EMITTING DIODE.

4,023,069. VERTICAL DEFLECTION CIRCUIT.

4,023,105. COUNTER TYPE REMOTE CONTROL RECEIVER PRODUCING BINARY OUTPUTS CORRELATED WITH NUMERICAL COMMANDS OF A COMPANION REMOTE CONTROL TRANSMITTER.

4,023,114. STAPLE WIDE DEVIATION LINEAR VOLTAGE CONTROLLED FREQUENCY GENERATOR.

4,023,129. DEFLECTING YOKE WITH NON-RADIAL CONDUCTORS.

4,023,160. ANALOG TO DIGITAL CONVERTER.

4,023,165. SIGNAL MODIFICATION TECHNIQUES.

4,030,138. RECORD PROTECTION SYSTEM.

4,030,316. PASSIVE COOLER.

4,030,657. WIRE LEAD BONDING TOOL.

4,030,815. HYDROSTATIC BEARING APPARATUS.

4,030,835. DEFECT DETECTION SYSTEM.

4,031,427. FLAT CATHODE RAY TUBE.

4,031,465. SCR, DIODE, DIAC, AND TRIAC TESTER.

4,031,476. NON-INTEGER FREQUENCY DIVIDER HAVING CONTROLLABLE ERROR.

4,031,485. METHOD FOR ACHIEVING GAS DYNAMIC LASING.

4,031,539. BROADBAND TURNSTILE ANTENNA.

4,031,546. DISC PLAYER AND STYLUS THEREFOR.

4,031,549. TELEVISION TUNING SYSTEM WITH PROVISIONS FOR RECEIVING RF CARRIER AT NONSTANDARD FREQUENCY.

4,031,597. METHOD OF ASSEMBLING A MOUNT ASSEMBLY IN THE NECK OF A CATHODE-RAY TUBE.

4,032,338. HALOGRAPHIC RECORDING MEDIUM EMPLOYING A PHOTOCONDUCTIVE LAYER AND A LOW MOLECULAR WEIGHT MICROCRYSTALLINE POLYMERIC LAYER.

4,032,340. METHOD OF IMPROVING THE SENSITIVITY OF ORGANIC VOLUME PHASE HALOGRAPHIC RECORDING MEDIA.

4,032,470. ELECTRO-OPTIC DEVICE.

4,032,819. RASTER CENTERING CIRCUIT.

4,032,839. CURRENT SCALING CIRCUITS.

4,032,851. COMPLEMENTARY SYMMETRY FET MIXER CIRCUITS.

4,032,852. FILTER WHICH TRACKS CHANGING FREQUENCY OF INPUT SIGNAL.

4,032,872. BEAM ADJUSTMENT ASSEMBLY FOR A CATHODE RAY TUBE.

4,032,903. CHARGE INJECTION DEVICE ARRAYS.

4,032,967. COMPLEMENTARY FIELD EFFECT TRANSISTOR SIGNAL MULTIPLIER.

4,032,976. SMEAR REDUCTION IN CCD IMAGERS.

Re. 29,177. SOLAR TORQUE COMPENSATION FOR A SATELLITE.

4,015,315. METHOD OF SETTING CATHODE-G1 SPACING.

4,015,707. CARRIER FOR SEMICONDUCTOR COMPONENTS.

4,016,016. METHOD OF SIMULTANEOUSLY FORMING A POLYCRYSTALLINE SILICON GATE AND A SINGLE CRYSTAL EXTENSION OF SAID GATE IN SILICON ON SAPPHIRE MOS DEVICES.

4,016,363. METHOD FOR ADHERING COMPONENTS PLATFORM TO CATHODE-RAY TUBE AND PRODUCT THEREOF.

4,016,433. GTO CIRCUITS.

4,016,550. CHARGE TRANSFER READOUT OF CHARGE INJECTION DEVICE ARRAYS.

4,016,564. MULTIPLE TARGET DATA RECEIVER FOR A COLLISION AVOIDANCE SYSTEM.

4,017,144. RECORDING ASSEMBLY FOR VOLUME HOLOGRAPHY.

4,017,677. SQUELCH CIRCUIT FOR A VIDEO RECORD PLAYER.

4,017,678. END-OF-PLAY CONTROL SYSTEM.

4,017,719. BINARY RATE MULTIPLIER WITH MEANS FOR SPACING OUTPUT SIGNALS.

4,017,741. DYNAMIC SHIFT REGISTER CELL.

4,017,747. FIRST TIMING CIRCUIT CONTROLLED BY A SECOND TIMING CIRCUIT FOR GENERATING LONG TIMING INTERVALS.

4,017,865. FREQUENCY SELECTIVE REFLECTOR SYSTEM.

4,017,882. TRANSISTOR HAVING INTEGRATED PROTECTION.

4,018,489. METHOD FOR EXTENDING CATHODE LIFE IN VIDICON TUBES.

4,018,506. FIBER-OPTIC TO PLANAR-WAVEGUIDE OPTICAL COUPLER.

4,018,692. COMPOSITION FOR MAKING GARNET FILMS FOR IMPROVED MAGNETIC BUBBLE DEVICES.

4,018,937. ELECTRON BEAM RECORDING COMPRISING POLYMER OF 1-METHYLVINYL METHYL KETONE.

4,018,945. METHOD OF MAKING A METALLIZED VIDEO DISC HAVING AN INSULATING LAYER THEREON.

4,018,984. VIDEO DISC RECORD HAVING SPIRALLY ALIGNED SYNC STORAGE LOCATIONS.

4,018,987. VIDEO DISC PLAYBACK APPARATUS.

4,018,988. NEGATIVE GAMMA CIRCUIT.

4,019,071. BIASING CURRENT ATTENUATOR.

4,019,082. ELECTRON EMITTING DEVICE AND METHOD OF MAKING THE SAME.

4,019,118. THIRD HARMONIC SIGNAL GENERATOR.

4,019,152. BIAS CIRCUIT FOR JUNCTION DIODES.

4,019,155. ACOUSTO-OPTIC MODULATED LASER.

4,019,818. INTERFEROMETRIC TECHNIQUE FOR DETERMINING ULTRASONIC WAVE INTENSITY.

4,020,147. METHOD FOR PREPARING CATHODOCHROMIC SODALITE.

4,020,416. METHOD OF DETECTING HEATER RESISTANCE INDEPENDENT OF CONTACT RESISTANCE.

4,020,500. CONTROLLED OSCILLATOR.

4,023,185. ABLATIVE OPTICAL RECORDING MEDIUM.

4,023,752. ELIMINATION OF RESIDUAL SPACECRAFT NUTATION DUE TO PROPULSIVE TORQUES.

4,024,069. YTTRIUM TANTALATE PHOSPHORS.

4,024,122. METHOD OF PURIFYING 2,4-BIS(6-DIAZO-5,6-DIHYDRO - 5 - OXO-1-NAPHTHALENESULFONYLOXY BENZOPHENONEL.

4,024,476. PROGRAMMABLE FREQUENCY DIVIDER FOR A TELEVISION RECEIVER FREQUENCY SYNTHESIZER.

4,024,569. SEMICONDUCTOR OHMIC CONTACT.

4,024,571. SYNCHRONIZING SYSTEM EMPLOYING BURST-CROSSOVER DETECTION.

4,024,572. PAL ALTERNATE LINE COLOR PHASE DETECTOR.

4,025,661. METHOD OF MAKING VIEWING-SCREEN STRUCTURE FOR A CATHODE-RAY TUBE.

4,025,842. CURRENT DIVIDER PROVIDED TEMPERATURE-DEPENDENT BIAS POTENTIAL FROM CURRENT REGULATOR.

4,025,945. COLOR FUNCTION DISPLAY SYSTEM.

4,025,959. RECORDER-REPRODUCER SYSTEM.

4,026,780. METHOD AND APPARATUS FOR CATAPHORETIC DEPOSITION.

4,027,179. HIGH REPETITION RATE INJECTION LASER MODULATOR.

4,027,192. ELECTROLUMINESCENT DEVICE COMPRISING ELECTROLUMINESCENT LAYER CONTAINING INDIUM OXIDE AND/OR TIN OXIDE.

4,027,260. CHARGE TRANSFER CIRCUITS EXHIBITING LOW PASS FILTER CHARACTERISTICS.

4,027,280. TRANSDUCER DRIVE CIRCUIT FOR REMOTE CONTROL TRANSMITTER.

General Electric Company is prepared to grant non-exclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Applications for license may be addressed to the General Electric Company, Aircraft Engine Group, 1000 Western Ave., Lynn, Mass. 01910, Attention : Patent Counsel.

3,112,915. ROTOR ASSEMBLY AIR BAFFLE.

2,123,283. ANTI-ICING VALVE MEANS.

3,138,930. COMBUSTION CHAMBER LINER CONSTRUCTION.

3,151,294. FREQUENCY SENSING CIRCUIT INCLUDING DIRECT CURRENT SOURCE AND REACTANCE MEANS.

3,237,864. LOW DRAG VARIABLE PLUG JET EXHAUST NOZZLE.

3,241,842. SEALING MEANS WITH COOLING FLUID MEANS.

3,249,906. THERMOCOUPLE CONNECTOR.

3,292,050. MOUNTING OF SOLID STATE ELECTRONIC COMPONENTS.

3,313,475. MOUNTING OF HARDWARE ON AXIAL FLOW COMPRESSOR CASINGS.

3,329,596. METHOD OF ELECTROLYTICALLY MACHINING BRANCH PASSAGES PROVIDING COMMUNICATION BETWEEN MAIN PASSAGES IN A METAL ARTICLE.

3,336,213. CATHODE FOR ELECTROLYTIC MACHINING.

3,339,574. PRESSURIZING AND DRAIN VALVE.

3,364,678. MEANS FOR STABILIZING FLUID FLOW IN DIFFUSER-COMBUSTOR SYSTEMS IN AXIAL FLOW GAS TURBINE ENGINES.

3,369,942. BEARING AND METHOD OF MAKING.

3,377,779. AIR SEPARATION DEVICE AND LIQUID DELIVERY SYSTEM INCORPORATING SAME.

3,383,093. HOLLOW TURBOMACHINERY BLADES.

3,395,534. SPEED RESPONSIVE AND CONTROL SYSTEMS FOR ROTORS.

3,398,535. ENGINE SUPPORTING STRUCTURE.

3,403,084. ELECTROLYTIC MATERIAL REMOVAL WHEREIN THE CURRENT-VOLTAGE RELATIONSHIP IS IN THE "KELLOGG REGION."

3,403,085. ELECTROLYTIC MATERIAL REMOVAL WHEREIN THE CHARGE IN THE ELECTROLYTE IS PARTIALLY DISSIPATE.

3,415,383. CENTRIFUGAL SEPARATOR.

3,415,672. METHOD OF CO-DEPOSITING TITANIUM AND ALUMINUM ON SURFACES OF NICKEL, IRON AND COBALT.

3,433,021. CONTROL SYSTEM HAVING OUTPUT VARIABLY RESPONSIVE TO TWO SIGNAL INPUTS.

3,442,176. ACTUATOR LOCKING MECHANISM.

3,442,442. MOUNTING OF BLADES IN AN AXIAL FLOW COMPRESSOR.

3,456,881. FLUID PRESSURE CONTROL SYSTEM.

3,472,480. FLOW CONTROL VALVE.

3,477,231. NOISE REDUCTION.

3,479,009. BLADE RETAINER.

3,489,534. LIGHTWEIGHT METALLIC STRUCTURE.

3,500,639. COMBUSTION CHAMBER MOUNTING MEANS.

3,501,089. JET PUMP EJECTOR.

3,519,282. ABRADABLE MATERIAL SEAL.

3,519,368. COMPOSITE TURBOMACHINERY ROTORS.

3,527,624. CONTROLLING CARBIDE SURFACES.

3,528,246. FAN ARRANGEMENT FOR HIGH BYPASS RATIO TURBOFAN ENGINE.

3,533,238. INLET CONTROL SYSTEM.

3,533,486. JET ENGINE SILENCER WITH RETRACTABLE SOUND ABSORBING BODY.

3,540,682. TURBOFAN TYPE ENGINE FRAME AND SUPPORT SYSTEM.

3,556,675. TURBOMACHINERY ROTOR WITH INTEGRAL SHROUD.

3,572,733. SHAFT SEAL USED IN GAS TURBINE ENGINES.

3,572,960. REDUCTION OF SOUND IN GAS TURBINE ENGINES.

3,572,971. LIGHTWEIGHT TURBO-MACHINERY BLADING.

3,574,082. CURRENT LEAK PROTECTIVE CIRCUIT.

3,579,805. METHOD OF FORMING INTERFERENCE FITS BY HEAT TREATMENT.

3,587,973. PROPULSION NOZZLES WITH IMPROVED SOUND SUPPRESSION.

3,588,037. EROSION SHIELD FOR A THROTTLING VALVE.

3,598,638. DIFFUSION METALLIC COATING METHOD.

3,611,724. CHOKED INLET NOISE SUPPRESSION DEVICE FOR A TURBOFAN ENGINE.

3,617,360. HIGH TEMPERATURE METALLIC DIFFUSION COATING AND METHOD.

3,618,699. MULTIPLE PURE TONE NOISE SUPPRESSION DEVICE FOR AN AIRCRAFT GAS TURBINE ENGINE.

3,619,640. STEM OVERCURRENT PROTECTION.

3,631,674. FOLDED FLOW COMBUSTION CHAMBER FOR A GAS TURBINE ENGINE.

3,632,223. TURBINE ENGINE HAVING MULTISTAGE COMPRESSOR WITH INTERSTAGE BLEED AIR SYSTEM.

3,638,865. FUEL SPRAY NOZZLE.

3,653,207. HIGH FUEL INJECTION DENSITY COMBUSTION CHAMBER FOR A GAS TURBINE ENGINE.

3,658,682. ELECTROLYTE SUPPLY SYSTEM.

3,667,221. FUEL DELIVERY APPARATUS.

3,667,985. METALLIC SURFACE TREATMENT METHOD.

3,668,052. CORRUGATED ARCUATE MEMBER.

3,679,566. APPARATUS WITH STEM OVERCURRENT PROTECTION.

3,685,931. APPARATUS FOR PRODUCING A CORRUGATED MEMBER.

3,686,041. METHOD OF PRODUCING TITANIUM ALLOYS HAVING AN ULTRAFINE GRAIN SIZE AND PRODUCT PRODUCED THEREBY.

3,693,749. REDUCTION OF GAS TURBINE ENGINE NOISE ANNOYANCE BY MODULATION.

3,696,500. SUPERALLOY SEGREGATE BRAZE.

3,696,678. WEIGHTED OPTICAL TEMPERATURE MEASUREMENT OF ROTATING TURBOMACHINERY.

3,700,348. TURBOMACHINERY BLADE STRUCTURE.

3,704,194. PERFORATED REINFORCED PLASTIC MEMBER AND METHOD FOR MAKING.

3,710,568. INTEGRAL TUBING AND/OR ELECTRICAL LEAD SUPPORT AND MOUNTING PAD FOR GAS TURBINE ENGINE CONTROLS AND ACCESSORIES.

3,714,778. ANNULAR COMBUSTOR SYSTEMS.

3,720,058. COMBUSTOR AND FUEL INJECTOR.

3,736,746. RECIRCULATING ANNULAR SLOT FUEL/AIR CARBURETING SYSTEM FOR GAS TURBINE COMBUSTORS.

3,748,107. SUPERALLOY EUTECTIC BRAZE.

3,757,827. LIGHTWEIGHT DUCT AND METHOD OF MAKING SAME.

3,759,091. ENGINE INLET DISTORTION TESTING APPARATUS.

3,764,307. NI-AU BASE BRAZING ALLOY.

3,764,510. METHOD AND APPARATUS FOR ELECTROLYTIC MATERIAL REMOVAL.

3,775,975. FUEL DISTRIBUTION SYSTEM.

3,777,489. COMBUSTOR CASING AND CONCENTRIC AIR BLEED STRUCTURE.

3,787,546. METHOD FOR MAKING A PERFORATED PLASTIC ARTICLE.

3,793,865. MIXER FABRICATION.

3,794,444. ANTI-ICING SPINNER CONSTRUCTION.

3,794,915. CIRCUITRY FOR DETECTING LOW AMPLITUDE RAPID VIBRATIONS IN A HIGH AMPLITUDE OUTPUT SIGNAL.

3,795,604. ELECTROLYTIC MACHINING ELECTRODE.

3,798,626. FOREIGN OBJECT IMPACT DETECTION IN MULTI-BLADED FLUID ENGINES.

3,819,008. BROAD BAND ACOUSTIC BARRIER.

3,830,056. CONVERSION MEANS FOR A GAS TURBINE ENGINE.

3,832,092. DEVICE FOR LOCKING TURBOMACHINERY BLADES.

3,833,414. ALUMINIDE COATING REMOVAL METHOD.

3,834,965. METHOD OF MAKING A LIGHTWEIGHT DUCT.

3,837,411. DIVERTER VALVE FOR A GAS TURBINE WITH AN AUGMENTER.

3,841,091. MULTI-MISSION TANDEM PROPULSION SYSTEM.

3,844,677. BLUNTED LEADING EDGE FAN BLADE FOR NOISE REDUCTION.

3,846,899. METHOD OF CONSTRUCTING A LABYRINTH SEAL.

3,847,781. APPARATUS FOR ELECTROLYTIC MATERIAL REMOVAL.

3,850,544. MOUNTING ARRANGEMENT FOR A BEARING OF AXIAL FLOW TURBOMACHINERY HAVING VARIABLE PITCH STATIONARY BLADES.

3,853,548. NI-AU BRAZING ALLOY.

3,854,285. COMBUSTOR DOME ASSEMBLY.

3,856,201. TEMPERATURE REGULATING CONTROL VALVE.

3,861,139. TURBOFAN ENGINE HAVING COUNTER-ROTATING COMPRESSOR AND TURBINE ELEMENTS AND UNIQUE FAN DISPOSITION.

3,861,140. TURBOFAN ENGINE MIXER.

3,861,822. DUCT WITH VANES HAVING SELECTIVELY VARIABLE PITCH.

3,866,415. FAN BLADE ACTUATOR USING PRESSURIZED AIR

3,866,417. GAS TURBINE ENGINE AUGMENTER LINER COOLANT FLOW CONTROL SYSTEM.

3,866,448. APPARATUS FOR CONSTRUCTING AIR COOLED TURBOMACHINERY BLADING.

3,867,068. TURBOMACHINERY BLADE COOLING INSERT RETAINERS.

3,868,196. CENTRIFUGAL COMPRESSOR WITH ROTATING VANELESS DIFFUSER POWERED BY LEAKAGE FLOW.

3,870,434. GEAR ARRANGEMENT FOR VARIABLE PITCH FAN.

3,873,236. FAN WITH VARIABLE PITCH BLADES AND TRANSLATING BEARING ACTUATION SYSTEM.

3,875,038. ELECTROLYTIC MACHINING APPARATUS.

3,879,940. GAS TURBINE ENGINE FUEL DELIVERY TUBE ASSEMBLY.

3,879,941. VARIABLE CYCLE GAS TURBINE ENGINE.

3,883,268. BLUNTED LEADING EDGE FAN BLADE FOR NOISE REDUCTION.

3,887,987. METHOD OF MAKING AND OF MEASURING ARTICLE FATIGUE LIFE.

3,888,601. TURBOMACHINE WITH BALANCING MEANS.

3,892,358. NOZZLE SEAL.

3,893,297. BYPASS AUGMENTATION BURNER ARRANGEMENT FOR A GAS TURBINE ENGINE.

3,893,640. SOUND SUPPRESSING NACELLE ARRANGEMENT.

3,897,001. NOZZLE AND AUXILIARY INLET ARRANGEMENT FOR GAS TURBINE ENGINE.

3,899,267. TURBOMACHINERY BLADE TIP CAP CONFIGURATION.

3,900,274. REMOTE CONTROLLED ACTUATION SYSTEM FOR THE ROTOR OF A GAS TURBINE ENGINE.

3,903,690. TURBOFAN ENGINE LUBRICATION MEANS.

3,908,447. METHOD OF MEASURING ARTICLE FATIGUE LIFE.

3,915,413. VARIABLE AIR INLET SYSTEM FOR A GAS TURBINE ENGINE.

3,921,271. AIR-COOLED TURBINE BLADE AND METHOD OF MAKING SAME.

3,922,628. STRAIN GAGE.

3,922,852. VARIABLE PITCH FAN FOR GAS TURBINE ENGINE.

3,923,420. BLADE PLATFORM WITH FRICTION DAMPING INTERLOCK.

3,925,979. ANTI-ICING SYSTEM FOR A GAS TURBINE ENGINE.

3,943,707. GAS TURBINE ENGINE EXHAUST NOZZLE DIVERTER VALVE.

3,949,775. FUEL SUPPLY AND DISTRIBUTION SYSTEM.

3,957,450. ARTICLE OF MANUFACTURE WITH PREDETERMINED FATIGUE LIFE.

3,965,066. COMBUSTOR-TURBINE NOZZLE INTERCONNECTION.

3,973,874. IMPINGEMENT BAFFLE COLLARS.

3,999,378. BYPASS AUGMENTATION BURNER ARRANGEMENT FOR A GAS TURBINE ENGINE.

Applications for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

3,816,798. TRIGGERABLE VACUUM ARC DEVICE SUITABLE FOR ALTERNATING CURRENT OPERATIONS.

3,823,343. COMMUTATION DIRECTING CIRCUIT FOR FAULT CURRENT LIMITING STATIC SWITCH.

3,883,792. OPTIMUM CONTROL SYSTEM FOR MINIMIZING HARMONIC EFFECTS IN HVDC POWER CONVERTERS.

3,654,528. COOLING SCHEME FOR A HIGH CURRENT SEMICONDUCTOR DEVICE EMPLOYING ELECTROMAGNETICALLY-PUMPED LIQUID METAL FOR HEAT AND CURRENT TRANSFER.

3,911,239. VACUUM ARC DEVICES WITH NON-WELDING CONTACTS.

Application for license may be addressed to the General Electric Company, Division Patent Counsel Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

D. 241,779. DESIGN FOR HAIR DRYER POWER UNIT OR SIMILAR ARTICLE.

D. 242,494. DESIGN FOR HAIR DRYER OR SIMILAR ARTICLE.

Applications for Licenses may be addressed to the Patent Counsel, Mobile Radio Products Dept., General Electric Company, Lynchburg, Va. 24502.

4,001,693. APPARATUS FOR ESTABLISHING COMMUNICATION BETWEEN A FIRST RADIO TRANSMITTER AND RECEIVER AND A SECOND RADIO TRANSMITTER AND RECEIVER.

4,014,715. SOLDER CLEANING AND COATING COMPOSITION.

4,022,973. APPARATUS FOR INDICATING SYNCHRONIZATION AND OUT-OF-SYNCHRONIZATION CONDITIONS.

4,027,243. MESSAGE GENERATOR FOR A CONTROLLED RADIO TRANSMITTER AND RECEIVER.

Application for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

3,570,266. REFRIGERATOR INCLUDING ICE MAKER WATER RESERVOIR.

3,726,578. CONVERTIBLE SIDE-BY-SIDE REFRIGERATOR.

3,868,152. REFRIGERATOR CABINET CONSTRUCTION.

3,874,552. REFRIGERATOR APPARATUS.

3,876,148. DISHWASHER HAVING EPICYCLIC SPRAY SYSTEM.

4,007,318. PHOSPHORYLATED POLYSTYRENE AND METHOD FOR FORMING SAME.

4,016,641. METHOD OF ADAPTING A MOBILE HOME FOR AN AIR CONDITIONER.

4,019,794. ROLLER FOR DISHWASHER RACK.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Company, 1 River Road, Building #500, Room 218, Schenectady, N.Y. 12345.

4,011,017. BORESCOPE SUPPORT APPARATUS.

Applications for licenses should be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa. 19101.

4,008,573. MOTIVE FLUIDS FOR EXTERNAL COMBUSTION ENGINES.

4,016,493. SIMPLIFIED LAND LINE AND SATELLITE COMMUNICATION SWITCHING SYSTEM.

4,016,494. SATELLITE COMMUNICATION SYSTEM WITH IMPROVED CONFERENCE FACILITY.

4,017,985. MULTISENSOR DIGITAL IMAGE GENERATOR.

4,025,248. RADIALLY EXTENDED VAPOR INLET FOR A ROTARY MULTIVANED EXPANDER.

Application for license may be addressed to the General Electric Company, 100 Woodlawn Ave., Pittsfield, Mass. 01201.

3,612,750. CABLE-CONNECTED ADAPTOR FOR HIGH VOLTAGE BUSHING OF A PAD-MOUNTED TRANSFORMER.

3,782,324. METER DIAL WITH MIRROR IMAGE PORTION.

3,792,404. CIRCUIT BREAKER HAVING MECHANICAL LOCK TO PREVENT AUTOMATIC OPERATION.

3,829,810. BUSHING, FUSE AND FUSEHOLDER.

4,009,417. ELECTRICAL APPARATUS WITH HEAT PIPE COOLING.

4,009,418. ATTACHMENT OF HEAT PIPES TO ELECTRICAL APPARATUS.

Application for license may be adressed to the General Electric Company, 2001 Jefferson Davis Highway, Arlington, Va. 22202.

3,996,081. METHOD FOR MAKING A HIGH VOLTAGE CABLE SPLICE.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions, Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUES

AUGUST 30, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,372

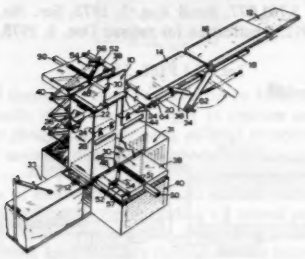
APPARATUS FOR AUTOMATICALLY STACKING AND COMPRESSING BATTS OF COMPRESSIBLE MATERIAL

Theodore Earl O'Brien, Watford, Canada, assignor to Patco Packing Limited, Sarnia, Canada

Original No. 3,908,539, dated Sept. 30, 1975, Ser. No. 505,805, Sept. 13, 1974. Application for reissue Aug. 9, 1976, Ser. No. 712,820

Int. Cl.[2] B30B *15/30*

U.S. Cl. 100—49 2 Claims



1. Apparatus for stacking and compressing batts of compressible material comprising:

i. a vertical stacking chamber,

ii. indexing gates in the upper portion of said stacking chamber normally disposed to receive batts,

iii. an indexing and compression plate,

iv. means for repeatedly cycling said indexing and compression plate around a first path [a predetermined number of times and then] *and* around a second path [once],

v. said first path extending upwardly of the outside *of* said stacking chamber laterally into said stacking chamber at a level above said indexing gates, downwardly in said stacking chamber, through said indexing gates, and laterally out of said stacking chamber, said second path extending upwardly of the outside of said stacking chamber, laterally into said stacking chamber, downwardly in said stacking chamber to a compression level in the lower portion thereof that is below the extent of downward travel of said first path and laterally out of said stacking chamber,

vi. said indexing gates being operable in response to the passage therethrough of said indexing and compression plate to permit said indexing and compression plate to carry batts thereon to the portion of said stacking chamber therebelow,

vii. an ejection passage extending across said stacking chamber at the lower end thereof and below said compression level through which batts underlying said index and compression plate at the compression level can be laterally removed from said stacking chamber,

viii. means for ejecting batts underlying said indexing and compression plate when said indexing and compression plate is at said compression level,

ix. said means for repeatedly cycling said indexing and compression plate being adapted to remove said compression plate out of said stacking chamber on said second path after operation of said means for ejecting batts.

Re. 29,373

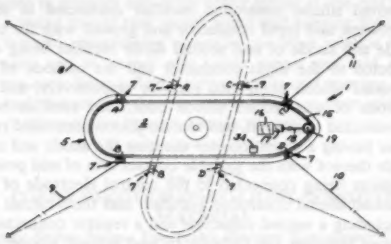
METHOD AND APPARATUS FOR MOORING FLOATING VESSELS

Henry C. Boschen, Jr., Chippewa Falls, Wis., assignor to Global Marine, Inc., Los Angeles, Calif.

Original No. 3,822,663, dated July 9, 1974, Ser. No. 296,079, Oct. 10, 1972. Application for reissue June 14, 1976, Ser. No. 695,842

Int. Cl.[2] B63B *21/50*

U.S. Cl. 114—293 8 Claims



1. A vessel intended to be floated in a body of water, said vessel comprising:

a. a hull;

b. guide means carried by said hull and substantially completely encircling said hull along a line [between the top of said hull and] *above* the Plimsoll line;

c. a plurality of attaching means moveably carried by said guide means for separately attaching a plurality of anchor lines to said hull and for controlling the length thereof; and

d. control means operably connectable to said attaching means for selectively moving said attaching means to selected points along said guide means to vary the position of the vessel, for holding said attaching means at said selected points and for operating said attaching means to control the length of said anchor lines.

Re. 29,374

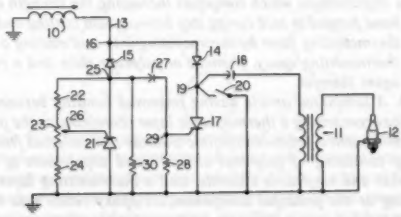
SOLID STATE IGNITION CIRCUITRY

Franklin H. Just; Brent L. Powell, and John A. Waters, all of Idaho Falls, Idaho, assignors to Franklin H. Just and John A. Waters, both of Idaho Falls, Idaho

Original No. 3,851,636, dated Dec. 3, 1974, Ser. No. 402,010, Oct. 1, 1973. Application for reissue Oct. 6, 1975, Ser. No. 620,147

Int. Cl.[2] F02P *3/06*

U.S. Cl. 123—148 CC 10 Claims



1. Circuitry for controlling the transmission of impulse volt-

ages produced by a magneto on an internal combustion engine to a transformer which, in turn, generates a high voltage impulse to produce sparks in the spark plugs of the engine, said circuitry comprising,

an input conductor *means* adapted to receive impulse voltages from a magneto;

a first circuit connected to said input conductor [compris] *means comprising* in series a first diode rectifier, a first capacitor and an output conductor, the latter being adapted to be connected to the transformer;

a second circuit connected between said first circuit and ground comprising, a first silicon controlled rectifier having an anode, cathode and a control electrode, with the cathode thereof connected to ground and the anode thereof connected to said first circuit between said first rectifier diode and said first capacitor;

a third circuit comprising, a second diode rectifier and a second silicon controlled rectifier connected in series between said input conductor and ground with the cathode and anode of said second diode rectifier being connected to the input conductor and the cathode of the second silicon controlled rectifier respectively, and the anode of said second silicon controlled rectifier being connected to ground, said second silicon controlled rectifier having a potentiometer shunting the anode and cathode thereof with the variable contact arm of said potentiometer being connected to the control electrode of said second silicon controlled rectifier, said third circuit also including a second capacitor and a resistor connected in series between the cathode of said second silicon controlled rectifier and ground, with the control electrode of said first silicon controlled rectifier being connected to said third circuit at a point therein intermediate between said second capacitor and said resistor.

Re. 29,375

LAMINATED POLYMERIC ARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

William Charles Thiele, Somerville, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Original No. 3,931,836, dated Jan. 13, 1976, Ser. No. 406,750, Oct. 15, 1973. Continuation-in-part of Ser. No. 225,662, Feb. 11, 1972, abandoned. Application for reissue July 28, 1976, Ser. No. 687,974

Int. Cl.² F16L *9/16, 9/12;* B32B *31/06, 27/12*

U.S. Cl. 138—141 **42 Claims**

22. In a process for bonding together a plastic layer comprising a thermoplastic poly(vinyl acetate), poly(methyl methacrylate), polystyrene, polybutene, poly(vinyl butyral) or polymeric olefinic chloride resin and a thermosetting layer comprising a liquid thermosetting epoxy, phenolic, or polyester resin, which layers are substantially chemically unbondable to each other;

which process comprises forming a surface solution, on the surface of said thermoplastic layer, of said thermoplastic resin and a coating comprising a butadiene resin and a mutual solvent for said butadiene resin and said thermoplastic resin; at least partially fusing said surface solution; applying to said coating said thermosetting layer in a substantially uncured state; and curing said thermosetting layer and simultaneously bonding said thermosetting layer to said coating;

the improvement which comprises increasing the strength of the bond formed in said curing step between said coating and said thermosetting layer by incorporating into said coating a solid thermosetting epoxy, phenolic or polyester resin and a curing agent therefor.

34. A laminated article having improved bonding between the laminae comprising a thermoplastic layer containing as the principal component a polymeric olefinic chloride resin selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride and vinylidene chloride, and a thermosetting layer containing as the principal component an epoxy resin, said layers being bonded into a laminate by a coating therebetween and an intimate contact therewith, said coating initially comprising:

a. a butadiene resin, which is thermoplastic, substantially curable to said epoxy resin and substantially chemically unbondable directly to and substantially incompatible with said polymeric olefinic chloride resin other than in a solvated state;

b. a solid epoxy resin;

c. a mutual solvent for at least said polymeric olefinic chloride resin and said butadiene resin; and

d. a curing agent for said solid epoxy resin;

said coating and said polymeric olefinic chloride resin forming a fused surface solution on the surface of said thermoplastic layer and said coating and said thermosetting layer being chemically bonded; and

said solid epoxy resin and said butadiene resin being present in said coating in a weight ratio of epoxy resin to butadiene resin in the range of 0.175:1 to 0.70:1.

Re. 29,376

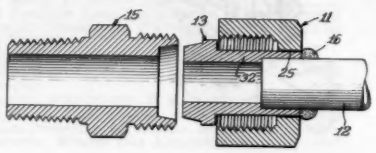
WELDED SLEEVE FITTING

Jan A. Hiszpanski, Chicago, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Original No. 3,751,077, dated Aug. 7, 1973, Ser. No. 229,707, Feb. 28, 1972. Application for reissue Dec. 2, 1975, Ser. No. 637,079

Int. Cl.² F16L *55/00*

U.S. Cl. 285—169 **12 Claims**



1. A tube coupling structure comprising: a body having a port and a threaded portion coaxially of said port; a tubular sleeve having an inner end adapted to sealingly engage the body, an annular radially outer, axially outwardly facing shoulder, and a tubular outer end extending axially outwardly of said shoulder and terminating in a distal end; an annular nut having a threaded portion threadedly connected to the body threaded portion, said nut coaxially encircling said sleeve and having an inturned flange disposed axially outwardly of said sleeve shoulder for engaging said shoulder to urge said sleeve into sealing engagement with said body as an incident of threaded advance of said nut toward said body; a tube end extending coaxially inwardly into said sleeve; and an annular weld between said sleeve distal end and said tube sealingly connecting the sleeve to the tube end, said weld and said shoulder having a radial outer dimension greater than the corresponding radial inner dimension of said nut flange whereby said nut flange is captured axially movably between said sleeve shoulder and said weld in the made-up arrangement of the tube coupling, the length of said sleeve outer end outwardly of said shoulder being preselected to permit withdrawal of the nut axially outwardly of the axially inner end of the sleeve thereby to permit separation of said sleeve and nut from said body with said nut flange maintained radially outwardly of said sleeve outer end.

Re. 29,377

FRANGIBLE CONCRETE-JOINT SEALANT PACKAGE

Robert O'Brill, 8116 Lorel, Skokie, Ill. 60076

Original No. 3,813,180, dated May 28, 1974, Ser. No. 307,037, Nov. 16, 1972. Application for reissue Jan. 27, 1975, Ser. No. 544,260

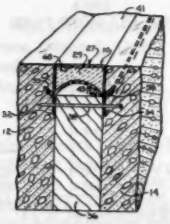
Int. Cl.² B65D *83/00*

U.S. Cl. 404—48 **11 Claims**

1. A frangible sealant [package] *device* for joints between adjacent panels, comprises:

[an] *a one piece* elongated tube-like bar having a hollow interior extending throughout its length, *said bar having a top wall and a pair of parallel spaced-apart depending exter-*

nal flanges extending longitudinally throughout the length of said bar on opposite sides of the top wall to form an upper U-shaped portion and having a bottom wall and a second pair of parallel spaced-apart downwardly depending external flanges extending longitudinally throughout the length of said bar on opposite sides of the bottom wall to form a lower U-shaped portion below said upper portion, said bar [and] having a pair of continuous lines of weakened areas extending longitudinally along its entire length on opposite



sides thereof to enable said bar to be broken apart longitudinally along said lines [;] *to separate said upper and lower portions; said bar being adapted to receive* a concrete-joint sealant [disposed] within said hollow interior of said bar;

[a pair of end walls sealing said sealant within said bar,] and said [bar further including a] *second* pair of parallel spaced-apart downwardly depending external flanges extending longitudinally throughout the length of said bar to *receive* an expansion joint strip therebetween.

Re. 29,378

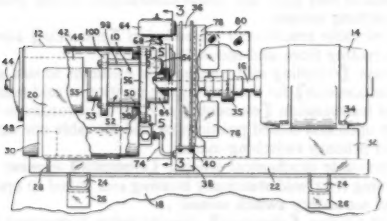
COMPACT HOUSING FOR ROTARY COMPRESSOR SYSTEM

Carl Bloom, Springfield, Mass., assignor to Worthington Compressors, Inc., Holyoke, Mass.

Original No. 3,547,164, dated Dec. 15, 1970, Ser. No. 785,304, Dec. 9, 1968. Application for reissue July 16, 1975, Ser. No. 596,364

Int. Cl.² B01D *46/00*

U.S. Cl. 55—473 **5 Claims**



1. A rotary compressor assembly comprising:

tank means for receiving compressed fluid, said tank means having one wall defining an opening and inner and outer wall surfaces, said tank means also having a discharge outlet for compressed fluid;

fluid compressing means including a housing disposed to extend into said opening in said tank means and a rotor mounted within said housing;

a drive means for said compressing means, said drive means including a drive shaft connected to said rotor;

said compressing means having an inlet disposed at a point external to said tank means and an outlet within said tank means to permit compressed fluid to be discharged therein;

demister means mounted in said tank means for separating out oil mixed in the discharge from said fluid compressing means;

said compressing means housing having cover means at the opposite ends thereof, one cover means being connected to the inwardly disposed end of the housing and the other cover means being connected to the opposite end of the housing and the one wall of the tank at the periphery of the opening, said other cover means coacting with said housing and said rotor to provide an operative seal between the outward end of said rotor and said other cover means;

sealing means located between one of said wall surfaces and the confronting surfaces of said other cover means adjacent the opening in the one wall of said tank means;

means providing a mechanical seal for said drive shaft at a point outboard of said other cover means; and

means to connect said other cover means at one end of said housing to said tank means about said opening for mounting said compressing means in operative relation to said tank and to permit said cover means and said sealing means to form a fluid tight cover for said opening in said tank means, and thereby prevent leakage from said compressing means housing to atmosphere.

Re. 29,379

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

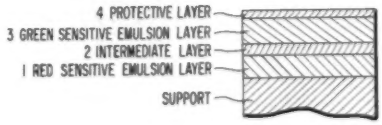
Keisuke Shiba; Nobuo Furutachi; Harumi Katsuyama; Takeshi Hirose; Toshiaki Aono, and Shoji Ishiguro, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Original No. 3,933,500, dated Jan. 20, 1976, Ser. No. 454,525, Mar. 25, 1974. Application for reissue Apr. 21, 1976, Ser. No. 678,815

Claims priority, application Japan, Mar. 23, 1973, 48-33238

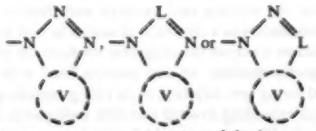
Int. Cl.² G03C *1/76, 7/00, 1/40*

U.S. Cl. 96—74 **13 Claims**



1. A color photographic silver halide light-sensitive material which comprises a support having thereon at least two light-sensitive layers, at least one of said layers containing a compound capable of coupling with an oxidation product of a color developing agent and in which a splitable hetero aromatic ring containing a triazole or diazole ring is connected to the carbon atom in the coupling position, through the nitrogen atom in the 1-position of said triazole or diazole ring, *said triazole or diazole ring having an aromatic ring fused thereto.*

13. The color photographic light-sensitive material of claim 1, wherein said splitable heteroaromatic ring is represented by the following general formulae



wherein V represents an aromatic ring of the benzene series or a heteroaromatic ring containing at least one nitrogen atom; L represents a methine group; and wherein V can contain substituents selected from the group consisting of an amino group, an acylamino group, a halogen atom, an alkyl group, a nitro group, an alkoxy group, an alkylthio group, an arylthio group, or an aryl group.

Re. 29,380

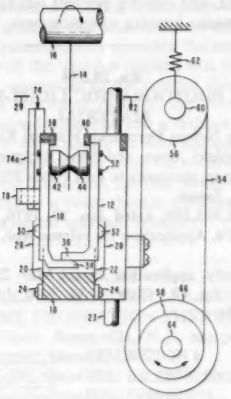
RECORDING APPARATUS FOR MAGNETIC DISKS USING BOTH SIDES OF THE DISK

Daniel O. Castrodale; Steven G. Steele; William S. Wentink, and Stephen E. Wheeler, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 3,946,439, dated Mar. 23, 1976, Ser. No. 545,841, Jan. 31, 1975. Application for reissue Sept. 20, 1976, Ser. No. 724,663

Int. Cl.[2] G11B *5/54, 5/48, 5/60*

U.S. Cl. 360—105 22 Claims



1. Magnetic recording apparatus comprising a magnetic medium having opposite sides both of which have a magnetic surface, a pair of transducers for magnetic action on the opposite sides of said medium, means for moving said magnetic medium so that a track or path is described by each of said transducers on a side of said medium, first and second swing arms each carrying one of said transducers, a carriage, a swing mounting for said first arm with respect to said carriage, a swing mounting for said second arm with respect to said carriage, means for moving said carriage and thereby said arms and said transducers in a direction at angles to said track so that the transducers traverse the magnetic medium on other tracks of the magnetic medium, an arm portion fixed with respect to said second swing arm adjacent to its swing mounting with said carriage and extending toward said first swing arm, and an arm portion fixed with respect to said first swing arm adjacent to its swing mounting with said carriage and extending toward said second swing arm to form a power transmitting connection with said arm portion of said second swing arm so as to swing said second swing arm and said transducer carried thereby away from said medium when said first swing arm is swung about its swing mounting with said carriage to move said first swing arm and said transducer carried thereby away from said medium.

Re. 29,381

ELECTRICAL SWITCHGEAR WITH PRIMARY AND SECONDARY SWITCH MEANS ASSOCIATED WITH CURRENT TRANSFORMER

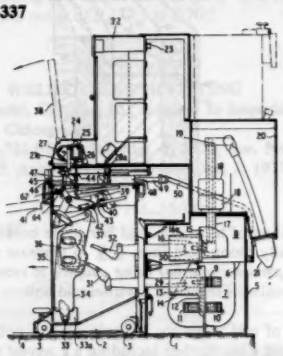
George Caton, Ilkley, England, assignor to Yorkshire Switchgear and Engineering Co., Limited, England

Original No. 3,842,321, dated Oct. 15, 1974, Ser. No. 340,263, Mar. 12, 1973. Application for reissue Apr. 12, 1976, Ser. No. 675,796

Claims priority, application United Kingdom, Mar. 16, 1962, 12482/72

Int. Cl.[2] H02B *11/06*

U.S. Cl. 361—337 13 Claims



1. Electrical switchgear, comprising:

a. a stationary housing containing current inlet and outlet conductors forming elements of a primary high voltage circuit, transformer means, at least one secondary circuit fed by the transformer means and secondary switch means for controlling said secondary circuit, *and trip control means;*

b. a movable housing containing primary switching means for said primary circuit, said primary switching means including contacts movable between open and closed positions, *and a spring-operated circuit breaker for moving said contacts to the open position to break said primary circuit;*

c. mating primary supply contacts on said stationary housing and said movable housing, said primary supply contacts mating with each other when said movable housing is in an operative position relative to said stationary housing to connect said inlet and outlet conductors to said primary switching means;

d. *a* movable mechanical transmission [elements] *element* projecting from said movable housing;

e. means [coupling said transmission elements to said movable contacts] for controlling the position of said *mechanical* transmission [elements] *element* in accordance with the open and closed positions of said movable contacts of said primary switching means;

f. *a* movable mechanical sensing [elements] *element* projecting from said stationary housing and linked to operate said secondary switch means;

g. said sensing [elements] *element* being juxtaposed with and engageable by said transmission [elements] *element* when said movable housing is in said operative position whereby said secondary switch means is controlled in accordance with the open and closed positions of said movable contacts of said primary switching means through said *mechanical* transmission [elements] *element* and sensing [elements] *element;*

h. *a mechanical operating member projecting from said stationary housing and controlled to move between different positions by said trip control means;*

i. *a mechanical trip member projecting from said movable housing and movable for controlling operation of said circuit breaker;*

j. *said mechanical trip member being juxtaposed with and engageable by said mechanical operating member when said movable housing is in said operative position whereby in response to a signal from said trip control means said mechanical operating member moves said mechanical trip member causing operation of said circuit breaker.*

PLANT PATENTS

GRANTED AUGUST 30, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,095

NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Aug. 30, 1976, Ser. No. 719,051

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is large, vigorous, upright to spreading, foliated with large to medium size, lanceolate, acutely pointed leaves having a glandular, crenate margin, and a regular and very productive bearer of large, uniform, symmetrical, globose to oblong, freestone fruit having yellow skin substantially overspread with red, yellow flesh, and a stone with a sweet kernel; the fruit being quite similar to that of the Red Diamond nectarine, but ripens about two weeks later.

4,096

APPLE TREE

Dan E. Simmons, Rogers, Ohio, assignor to Hilltop Orchards & Nurseries, Inc., Hartford, Mich.

Filed Oct. 6, 1976, Ser. No. 730,234

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple trees substantially as described and illustrated in this application.

PATENTS

GRANTED AUGUST 30, 1976

ERRATA

For CLASS	See PATENT NO.
273–136 F	4,045,013
351–132	4,045,137
351–178	4,045,138
195–103.5 R	4,045,296
195–103.5 R	4,045,297
195–080 R	4,045,298
202–093	4,045,299
225–002	4,045,356
250–527	4,045,359
542–413	4,045,434
544–028	4,045,435
544–023	4,045,436
544–017	4,045,437
544–029	4,045,438
424–330	4,045,580
200–153 K	4,045,650
363–089	4,045,719
363–126	4,045,722
346–075	4,045,770
364–900	4,045,779
364–900	4,045,780
364–200	4,045,781
364–200	4,045,782

PATENTS

GRANTED AUGUST 30, 1975

ERRATA

CLASS	PATENT NO.
273-136 F	4,065,013
331-132	4,065,127
331-178	4,065,138
195-102.5 R	4,065,256
195-102.5 R	4,065,257
195-080 R	4,065,258
202-027	4,065,259
228-002	4,065,260
250-527	4,065,261
340-413	4,065,262
344-028	4,065,263
344-027	4,065,264
344-029	4,065,265
428-370	4,065,266
208-139 R	4,065,267
363-089	4,065,268
363-124	4,065,269
346-072	4,065,270
344-900	4,065,271
364-900	4,065,272
364-900	4,065,273
364-900	4,065,274

PATENTS

GRANTED AUGUST 30, 1977

GENERAL AND MECHANICAL

4,044,399

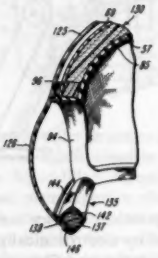
SAFETY HELMET WITH INDIVIDUALIZED HEAD-CONTOURED INTER-LINER

William G. Morton, Box 841, Hopewell, Va. 23860

Continuation-in-part of Ser. No. 570,712, April 23, 1975, Pat. No. 3,992,721, which is a continuation-in-part of Ser. No. 360,950, May 16, 1973, Pat. No. 3,882,546, which is a continuation-in-part of Ser. No. 323,195, Jan. 12, 1973, abandoned. This application Sept. 9, 1976, Ser. No. 721,871

Int. Cl.[2] A42B *3/00*

U.S. Cl. 2—414 **8 Claims**



1. An improved safety helmet assembly comprising a substantially rigid dome-shaped outer shell including a pair of depending ear portions, a dome-shaped inner shell disposed within said outer shell, a deformable dome-shaped headpiece of substantially uniform thickness and spaced within said inner shell to define a dome-shaped cavity therebetween, said headpiece being effective to receive and cover the wearer's head and to conform to the contour of the head over the area covered by said headpiece, said headpiece having an outwardly projecting and peripherally extending integral flange portion forming the lower edge portion of said headpiece, means for connecting said flange portion of said headpiece to the corresponding lower edge portion of said inner shell adjacent the bottom of said cavity and cooperating with said inner shell and said headpiece to form a removable inter-liner, an edge roll assembly mounted on the lower surface of each said ear portion of said outer helmet shell and having opposite ends terminating generally adjacent said flange portion of said headpiece, and said edge roll assemblies include resilient foam material adapted to be deformed to provide for conveniently removing and replacing said inter-liner.

4,044,400

HELMET RETENTION SYSTEM

Lester R. Lewicki, Woodland Hills, and James D. Santacroce, Beverly Hills, both of Calif., assignors to Bell Helmets Inc., Norwalk, Calif.

Filed Oct. 18, 1976, Ser. No. 733,139

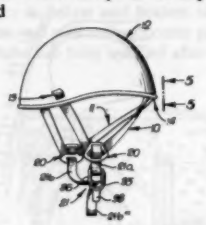
Int. Cl.[2] A42B *7/00*

U.S. Cl. 2—421 **12 Claims**

1. In a helmet retention system including a forwardly facing helmet,

a. left and right side retention strap sections, the left section having attachments to the helmet at forward and rearward locations, and the right section having attachments to the helmet at forward and rearward locations, the sections hanging from the helmet,

b. left and right sliders respectively slidably attached to the left and right retention straps to be adjustably slidable therealong, and



c. chin strap means having attachment to and hanging from the sliders to extend therebetween.

4,044,401

ARTIFICIAL BLADDER

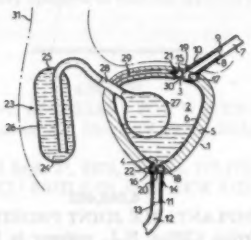
Jacques Guiset, 62, rue E., Delesalle Lille (Nord), France

Filed Aug. 3, 1976, Ser. No. 711,209

Claims priority, application France, Aug. 4, 1975, 75.25283

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1 **20 Claims**



1. An artificial bladder characterized in that it comprises: a leak-proof enclosure wall internally forming a closed cavity which is accessible through two upper apertures and through one lower aperture, means for connecting each of the upper apertures to a ureter, means for connecting the lower aperture to the urethra, a balloon made of leak-proof, flexible material which is positioned inside the said cavity and internally forms a closed space, means for selectively introducing a fluid into the said balloon or for extracting it therefrom so as to inflate and deflate it respectively, means for sealing the two upper apertures, which are normally open and means for opening the lower aperture, which is normally closed when the said balloon is inflated so as to induce urination.

4,044,402

LARYNGEAL PROSTHESIS

Nigel Edwards, Bristol, England, assignor to National Research Development Corporation, London, England

Filed Feb. 28, 1975, Ser. No. 554,125

Claims priority, application United Kingdom, Mar. 1, 1974, 9345/74

Int. Cl.[2] A61F *1/20*

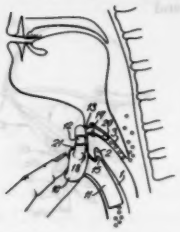
U.S. Cl. 3—1.3 **9 Claims**

1. For a laryngectomee with a fistula and a tracheostome, a aryngeal prosthesis comprising:

a hollowed body having a fistular tube and a tracheal tube connected thereto to respectively communicate the hollow of said body with said fistula and tracheostome, and

a valve mechanism mounted in said body to open and close said hollow body relative to the exterior of said body, said valve mechanism including first valve member operable to move from one position for opening said hollow body to

another position for closing said hollow body in response to a substantially predetermined first value of air pressure in said hollow, said mechanism including a second valve member operable to move from one position for closing



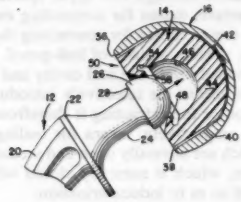
said hollow body to another position for opening said hollow body in response to a substantially predetermined second value of air pressure in said hollow body and said second value of air pressure being higher than said first value.

4,044,403

IMPLANTABLE JOINT PROSTHESIS

Joseph D'Errico, Clifton, N.J., assignor to Howmedica, Inc., New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,586
Int. Cl.² A61F 1/24
U.S. Cl. 3—1.913 **9 Claims**



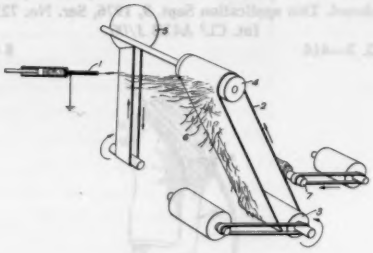
5. An implantable component for cooperatively engaging an implantable prosthetic member having a substantially spherical head to form an articulating joint prosthesis, said component having a substantially congruent cavity formed therein for cooperatively engaging said spherical head, said cavity having hemispherical portion terminating in a diametral plane and an entrance portion extending beyond said plane and terminating in a circular entrance to said cavity, an outwardly tapering guideway surrounding said entrance, said component further having a continuous annular groove formed substantially at said diametral plane and adjacent said guideway, said guideway and said groove defining between them a resilient annular lip surrounding said entrance, said lip being inwardly deformable during insertion of said spherical head through said entrance to admit and entrap said head in said cavity, and said lip being outwardly deformable to resist escape of said head from said cavity.

4,044,404

FIBRILLAR LINING FOR PROSTHETIC DEVICE

Graham Ernest Martin; Ian Derek Cockshott, both of Runcorn, and Francis James Thomas Fildes, Macclesfield, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 1, 1975, Ser. No. 600,942
Claims priority, application United Kingdom, Aug. 5, 1974, 34338/74
Int. Cl.² A61F 1/02
U.S. Cl. 3—19 **17 Claims**



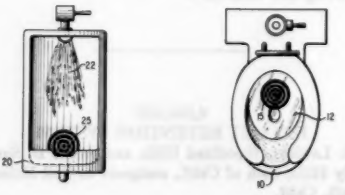
1. A lining for a prosthetic device comprising a mat of organic fibers prepared by electrostatically spinning an organic material and collecting the spun fibers on a suitable receiver.

4,044,405

TARGET IN A BOWL OR URINAL TO ATTRACT THE ATTENTION OF URINATING HUMAN MALES

Joel S. Kreiss, Washington Valley Road, Martinsville, N.J. 08836

Filed Jan. 27, 1976, Ser. No. 652,816
Int. Cl.² A47K 17/00
U.S. Cl. 4—1 **8 Claims**



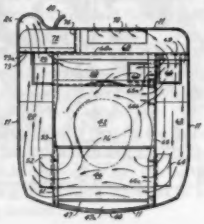
1. In a toilet bowl or urinal the combination comprising:

A target means to attract the attention of urinating human males to be wholly disposed within the bowl or urinal and to be permanently connected to the bowl or urinal; said target means being flexible prior to being non-removedly connected; said target being disposed in said bowl or urinal such that no part of said target extends outside of the volume partially enclosed by said bowl or urinal; and said target being void of moving parts.

4,044,406
COMPACT PORTABLE SELF-CONTAINED AEROBIC DIGESTION TOILET

William J. Hargraves, 121 Lake Highlander Mobile Home Park, County Road No. 1, Dunedin, Fla. 33528

Filed July 1, 1975, Ser. No. 591,069
Int. Cl.[2] E03D 5/016
U.S. Cl. 4—10 3 Claims



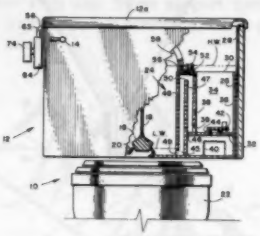
1. An aerobic digestion toilet structure for purifying organic waste material dissolved or dispersed in water comprising: a toilet bowl; a main liquid-filled digestion chamber having vertical side walls said main digestion chamber being divided into first and second side-by-side portions by a vertical weir having an upper edge slightly below the liquid level in said chamber portions inlet means communicating with said first chamber portion for receiving organic waste from the bowl; a plurality of secondary liquid-filled digestion chambers surrounding the vertical side walls of said main chamber and forming therewith a unitary portable structure; means connecting said chambers in series such that a volume of waste added to said main chamber displaces liquid sequentially into the last downstream secondary chamber, said connecting means including between each two serially-connected chambers a quiescent chamber in which solids settle by gravity and means forming an overflow outlet from the respective quiescent chamber to the next downstream digestion chamber, the quiescent chamber associated with said main digestion chamber being in communication with said second chamber portion at a location remote from said weir; means for continuously mixing the contents of each digestion chamber to maintain any solids therein in suspension and for continuously aerating the contents of each chamber, said mixing and aerating means including air inlet means located adjacent the lower end of said weir and wherein said first and second chamber portions have bottom walls inclined downwardly toward the lower end of said weir to cause circulation of the liquid in each of said chamber portions in a direction upward along said weir, then away from said weir, then downwardly along respective chamber side walls and then toward said weir; and a pump carried by said unitary structure for pumping rinse liquid from one of the secondary chambers to said bowl.

4,044,407
TOILET WATER SAVER DEVICE

George E. Silcox, 1532 Sierra Drive, Petaluma, Calif. 94952

Filed May 4, 1976, Ser. No. 683,179
Int. Cl.[2] E03D 1/22, 1/34, 5/02
U.S. Cl. 4—40 4 Claims

1. A toilet tank water saving device comprising:
an open top container with generally vertical side and end walls, and a bottom wall adapted to be positioned in a toilet tank above the bottom thereof:
an aperture in one end wall adjacent said bottom wall;
spaced upright side wall members extending outward from said one end wall, said side wall members extending vertically from the tops of said container to below said bottom wall;
an outer partition spanning the ends of said side wall members from the top therof to below said bottom wall and being spaced from the bottom of said tank;
a cover spanning the tops of said sidewall members, said one end wall and said outer partition;
an intermediate partition spanning said side panels from below said cover to below said bottom wall and spaced between said one end wall and said outer partition to form an inverted U-tube has been inserted after "wall".

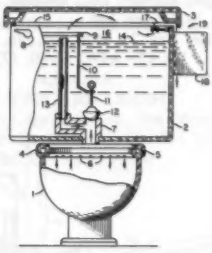


means sealing between said intermediate partition and said bottom wall;
a check valve in the lower portion of said container to enable one-way flow therein; and
means selectively operable to vent the inverted U-tube to the atmosphere.

4,044,408
DEODORIZING ACCESSARY FOR WATER CLOSETS

Raymond H. Pearson, 627 Sherwood Drive, Richardson, Tex. 75080

Filed Sept. 27, 1976, Ser. No. 727,174
Int. Cl.[2] E03D 9/05, 9/04; A47K 3/22
U.S. Cl. 4—213 5 Claims



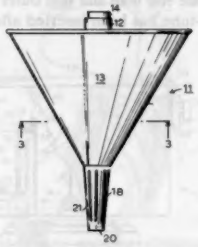
1. A deodorizing accessary for water closet including a toilet bowl, water tank and water tank cover, said water tank including an overflow conduit, whereby water in excess of the desired water level may be dispensed into said toilet bowl, and through which odorous air may be induced from said toilet bowl, said water tank also including a flushing mechanism whereby water may be discharged into said toilet bowl so as to flush said toilet bowl, and an air space above the water level, said accessary comprising air blower means having an inlet communication with said overflow conduit whereby odorous air may be induced from said toilet bowl, control means operable to initiate and terminate the odorous air flow, the air valve means in said inlet communication said air valve means operable to close when said accessary is not in use, retarding the intrusion of water vapor from said water tank into said accessary, said air valve means operable to open so as to pass said odorous air flow when said accessary is in use, said air valve means also operable to open so as to pass air into said water tank air space when said toilet bowl is flushed.

4,044,409

VERTICALLY SLOTTED STRAINER

Harry N. Hood, 302 Thorn St., San Diego, Calif. 92103

Filed Mar. 8, 1976, Ser. No. 664,888
Int. Cl.[2] E03C 1/26
U.S. Cl. 4—292 2 Claims



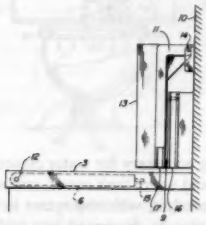
1. A sink strainer comprising:
a hollow vertical cylindrical member open on each end thereof, said vertical cylindrical member having a lower end portion dimensioned for being snugly received by a sink drain opening;
a plurality of vertical slots disposed in said vertical cylindrical members; and
a funnel member coupled to a lower portion of said vertical cylindrical member above said lower end portion, said funnel member diverging toward the plane of the top portion of said vertical cylindrical member.

4,044,410

COMBINATION BUNK BED AND SEAT

Richard Klingler, Elkhart, Ind., assignor to Holiday Rambler Corporation, Wakarusa, Ind.

Filed Aug. 23, 1976, Ser. No. 716,527
Int. Cl.[2] A47C 13/00, 17/04
U.S. Cl. 5—9 R 2 Claims



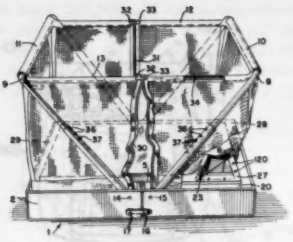
1. A foldable bunk bed and seating arrangement comprising a first horizontally disposed bed surface located adjacent a wall, a second bed surface vertically spaced from said first surface, said second surface having a first generally rigid segment, and a second lip segment hingedly connected to said first segment so as to permit approximately 180° rotational movement of said second segment from a rigid position coplanar with said first segment to a position approximately parallel to and contiguous with said first segment, said first segment eccentrically mounted to the wall a distance so as to accommodate the thickness of said second segment when the second bed surface is in the seating mode, support means engageable with said second segment to support said segment in its coplanar position.

4,044,411

TRANSPORTABLE FOLDING CRIB

Jerald G. Peterson, Apt. 11C Northgate Square, Reston, Va. 22090

Filed Aug. 29, 1975, Ser. No. 609,006
Int. Cl.[2] A47C 29/00
U.S. Cl. 5—99 A 17 Claims



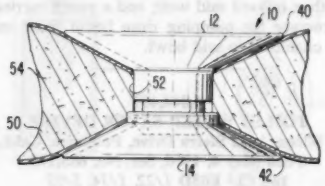
1. A suitcase-crib combination comprising:
a suitcase structure having an outer wall formed in two halves and an inner wall structure formed in two halves, said inner wall structure being spaced apart from said outer wall structure;
hinge means coupling said two halves of said inner wall structure and said two halves of said outer wall structure together to form said suitcase structure; and
a folding crib structure having a pair of telescoping rods and a mesh wall structure secured to said telescoping rods, said telescoping rods being pivotally secured in the space between said inner wall structure and said outer wall structure, one of said pair of rods being pivotally secured to one of said halves of inner and or outer wall and the other of said rods being pivotally secured to the other of said halves, said telescoping rods and said mesh wall structure of said folding crib being folded into spaces formed between said inner wall structure and said outer wall structure and said suitcase being closed when said suitcase-crib combination is not in use.

4,044,412

TUFTING BUTTON

James Elliott Barron, Midland, Tex., assignor to Magnatex Corporation, Midland, Tex.

Filed July 2, 1976, Ser. No. 702,370
Int. Cl.[2] A47C 27/00; A44B 1/18, 17/00
U.S. Cl. 5—356 3 Claims



1. A tufting button for a cushion having an upper substantially planar surface, a lower substantially planar surface and a tufting material disposed therebetween, the tufting button comprising:
a first enlarged flanged portion having a central aperture therein and conically configured sides sloping toward the central aperture;
a first cylindrical portion connected to said enlarged flange portion and havig a central longitudinal axis in alignment

with the center of the aperture in said first enlarged flange portion;

a second enlarged flange potion having a central aperture therein and conically configured sides sloping toward the central aperture;

a second cylindrical portion connected to said second enlarged flange portion and having a central longitudinal axis in alignment with the center of the aperture in said second enlarged flange portion;

first means connected to said first cylinder portion for engaging and interconnecting said first cylinder portion with said second cylinder portion; and

second means connected to said second cylinder portion for cooperatively engaging and interconnecting with said first means for connecting said second cylinder portion with said first cylinder portion, wherein

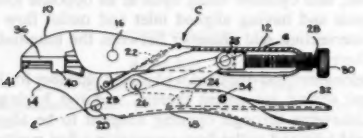
fluid contacting either of said first or second enlarged flange portions will be funneled into and axially through said first and second cylindrical portions of the tufting button without contaminating the tufting material of a cushion tufted with the tufting button.

4,044,413

CLAMP ASSEMBLY WITH GUIDE MEANS FOR REMOVING SELECTED ARC LENGTH OF CLAMPED RING FOR SIZE REDUCTION

Dalton R. Tucker, 1803 Rockefeller Lane, Redondo Beach, Calif. 90277

Filed Sept. 28, 1976, Ser. No. 727,697
Int. Cl.² B25B *7/22*
U.S. Cl. 7—3 R **5 Claims**



1. A composite clamp assembly comprising a clamp having a pair of adjustable clamp jaws and means for functionally opening and closing same, each clamp jaw carrying an extension jaw having clamp faces of corresponding transverse arcuate curvature and disposed in position to clamp an arcuate segment of a workpiece such as a ring therebetween, one extension jaw consisting of an arcuate surfaced plate laterally projecting beyond one of said clamp jaws, such projecting portion being characterized by at least one longitudinal tongue forming an open-ended guide slot having mutually parallel side walls extending adjacent a side of the clamp jaw, each side of said slot and of said tongue thus forming guide walls jointly defining different arc lengths of a clamped workpiece, the width of said slot and of said tongue corresponding to aliquot parts of an arcuate unit distance, whereby a desired arc length of a clamped workpiece may be severed by making cuts along a selected pair of said guide walls as by moving a juxtaposed sawblade therealong, said clamp assembly including interlocking means for preventing lateral displacement of one extension jaw relative to the other when in functional engagement.

4,044,414

BOAT CONSTRUCTION AND MOLD

Felix John Grycel, III, 14322 Emelita, Van Nuys, Calif. 91401

Filed June 23, 1976, Ser. No. 698,953
Int. Cl.² B63B *3/00*
U.S. Cl. 9—6 R **11 Claims**

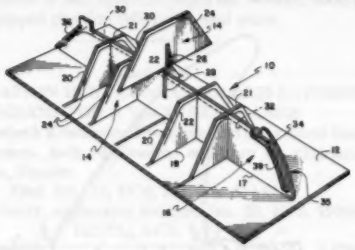
1. A method of constructing a framed structure comprising the steps of:

forming a mold base surface to support a mold assembly,

forming a first peripheral edge of each of at least a pair of frame members from construction material, said material serves as a frame support member for said at least a pair of frame members of said structure,

forming a second side substantially opposite each frame first peripheral edge a predetermined distance from said first peripheral edge, said second side forming a base for said at least a pair of frame support members,

cutting partially through the frame support member forming each of said frame members to form a third inwardly facing edge of said frame member without removing said frame member from said frame support member, each partially cut frame member remaining an integral part of said support member,



attaching said second side forming said base of said at least a pair of frame support members to said mold base surface, said frame support members being affixed substantially perpendicular to said mold base surface and in substantially spaced parallel relationship with each of the other of said at least a pair of frame support members,

attaching at least one sheet member formed from said construction materials to the first peripheral edge of each of said at least a pair of partially cut frame members affixed to said mold base surface,

severing each frame member from its frame support member affixed to said mold base surface, and

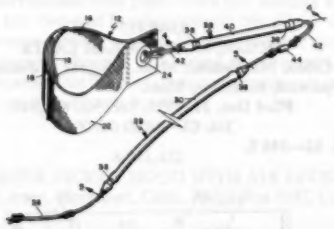
removing said framed structure from said severed frame support members affixed to said mold base surface.

4,044,415

SURFBOARD LEASH

Bruce G. Wood, 4943½ Cape May Ave., San Diego, Calif. 92107

Filed Apr. 12, 1976, Ser. No. 675,732
Int. Cl.² A63C *15/06*
U.S. Cl. 9—310 E **3 Claims**



2. An ankle leash for securing a surfboard to a surfer comprising:

a. an elongated line having means at each end to engage a surfer's ankle and a surfboard, respectively;

b. a first portion of said line being elastic and capable of stretching from a first length to a second length and being substantially inextensible beyond said second length;

c. a second portion of said line being elastic and of elastic strength greater than that of said first portion; and

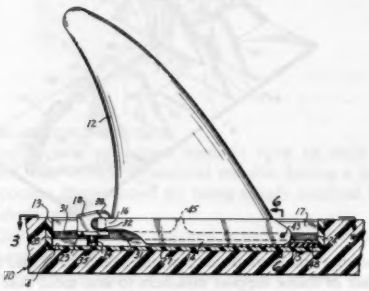
d. said first and second line portions each comprise an elastic

tube having cord loops securely connected within and extending from each of the ends thereof, said loops releasably connecting said portions to each other and to said means to engage the surfer's ankle and the surfboard.

4,044,416
SURFBOARD WITH ADJUSTABLE FIN

Charles A. Brewer, 72957 Joshua Tree St., Palm Desert, Calif. 92660, and Richard A. Brewer, 61479 Kamehameha Highway, Honolulu, Hawaii 96712

Filed June 14, 1976, Ser. No. 696,088
Int. Cl.² A63C *15/00*
U.S. Cl. 9—310 E **62 Claims**

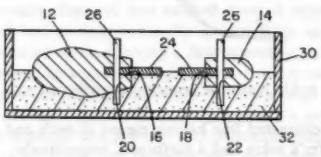


10. A surfboard structure comprising in combination:
a surfboard;
a fin for said surfboard having a longitudinal fin base having first and second end portions;
a fin holder in the underside of said surfboard defining an elongate channel extending lengthwise of said surfboard for receiving said fin base for lengthwise adjustment of said fin relative to said surfboard; and
means engageable with said fin holder and fin base for releasably retaining said fin relatively to said surfboard at variable locations, said retaining means including a clamp having a mouth portion for receiving one of said first and second end portions of said fin base and having a manually engageable top portion projecting out of said fin holder and reaching over said one end portion of said fin base into engagement with said one end portion, means for mounting said clamp for lengthwise sliding movement in said fin holder, and means for selectively arresting movement of said clamp in said fin holder.

4,044,417
MOLDING FOOTWEAR LASTS

Arnold Cohen, Marblehead, Mass., assignor to Jones & Vining, Incorporated, Braintree, Mass.

Filed Dec. 31, 1975, Ser. No. 645,547
Int. Cl.² A43D *00/00*
U.S. Cl. 12—146 L **10 Claims**

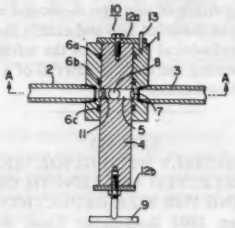


1. A method of making molded footwear lasts, comprising the steps of
preparing an oversized model of the last to be molded,
isolating, applying mold release to, and covering with liquid instant set polymer (ISP) at least first and second surface portions of said model,
allowing said ISP to cure to form at least first and second mold portions, and
using said mold portions to mold plastic lasts.

4,044,418
TUBE SCRUBBING APPARATUS

Masaichi Ishii, Sakai, and Kazuo Mihara, Hyogo, both of Japan, assignors to Daicel Ltd., Sakai, Japan

Filed May 21, 1976, Ser. No. 688,607
Claims priority, application Japan, June 6, 1975, 50-68329
Int. Cl.² B08B *9/04*
U.S. Cl. 15—104.06 A **7 Claims**



1. An apparatus for inserting cleaning elements into pipes, comprising:
an elongated cylinder defining an internal elongated chamber, said cylinder being open at its opposite longitudinal ends and having aligned inlet and outlet flow passages intersecting said chamber between the longitudinal ends thereof;
an elongated rod disposed within said chamber for longitudinal sliding movement therein, said rod having a single transverse through opening adapted to be aligned with said inlet and outlet flow passages in a first position of said rod in said chamber, said rod being longer than said cylinder and having a first imperforate end portion which extends from said through opening through and beyond one longitudinal end of said chamber, said rod having a second imperforate end portion which extends from the opposite side of said through opening to the other longitudinal end of said chamber, said rod being movable between said first position and a second position in which said through opening is positioned outside of said chamber and said first end portion is aligned with said inlet and outlet passages so that cleaning element means can be inserted into said through opening while said first end portion prevents flow of fluid from said inlet and outlet flow passages into said chamber, said cylinder having at least two annular sealing means mounted therein and sealingly contacting the periphery of said rod, one of said sealing means being located on one longitudinal side of said cylinder from said flow passages for continuous sealing engagement with said first end portion and the other of said sealing means being located on the opposite longitudinal side of said cylinder from said flow passages for continuous sealing engagement with said rod.

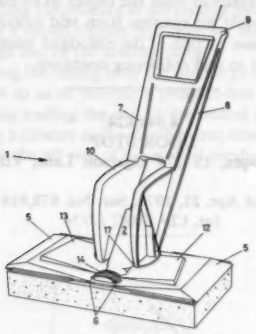
4,044,419
MOP WRINGER

Paul E. Robinson, Adelaide, Australia, assignor to Sabco Limited, Albert Park, Australia

Filed Feb. 25, 1976, Ser. No. 661,130
Claims priority, application Australia, Mar. 6, 1975, 0814/75
Int. Cl.² A47L *13/146*
U.S. Cl. 15—119 A **6 Claims**

1. A squeeze mop comprising a mop body, and a pair of wings hinged to the mop body at opposite sides thereof with a

mopping element affixed to the undersurface of the wings, the mop body having a socket for the reception of a handle of the mop, characterized by a one piece actuator pivoted to the mop body, the actuator comprising a lever including a handle and a pair of members to engage the wings, the actuator being pivoted about an axis transverse to the hinging of the wings to the body and the pivotal axis being adjacent the rear of the wings, the pair of members straddling the handle socket and having



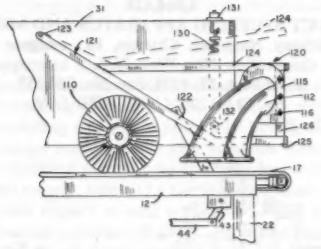
portions extending forwardly as radius arms from the pivotal axis of the actuator, flat bottom surfaces of the radius arms being in engagement with the wings to form stops to limit upward movement of the wings, actuation of the lever forwardly forcing the wings downwardly, and the final squeezing is caused by the inside surfaces of the members engaging the upper surfaces of the wings with a wedging or camming action.

4,044,420

PAN CLEANING APPARATUS

Douglas R. Hanson, 1720 - 9th Ave. South, Minneapolis, Minn. 55404

Continuation-in-part of Ser. No. 496,105, Aug. 9, 1974, Pat. No. 3,999,238. This application June 26, 1975, Ser. No. 590,404
Int. Cl.[2] B08B *9/08*
U.S. Cl. 15—304 **4 Claims**



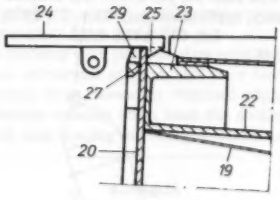
1. A cleaning apparatus for flat pans having means forming a plurality of receptacles therein comprising a frame, conveyor means on said frame to support and move a pan to be cleaned generally in a plane along said frame from a first end of said frame to a second end of said frame, a vacuum hood mounted on said frame and positioned to overlie a pan moving along said first plane, said vacuum hood having peripheral edges defining a downwardly facing opening, said opening overlying an area of said conveyor means, means to support said vacuum hood relative to said frame comprising a pivoting subframe pivotally mounted with respect to said frame to permit said vacuum hood to more upwardly relative to said conveyor means as said subframe pivots without substantially changing the orientation of said opening relative to the conveyor means during normal operation, a source of vacuum connected to said vacuum hood to subject a pan to a vacuum induced airflow across the entire opening of said hood as a pan is moved below said opening, air tube means to carry air under pressure from a source, means to mount said air tube means adjacent a leading edge of said opening first overlying a pan being moved by said conveyor means, an air source connected to said air tube means, said air tube means including passageways defined therethrough having axes positioned at an angle with respect to said plane to direct streams of air under pressure in a direction downwardly toward a pan supported on said conveyor means and below said opening whereby material agitated by said stream of air will be subjected to said vacuum induced airflow from said vacuum hood, and stop means to stop downward movement of said subframe when the vacuum hood is in a desired stopped position relative to said plane.

4,044,421

COMBINATION DUST CONTAINER AND LATCHING MEANS FOR A VACUUM CLEANER

Kerstin Elisabeth Kristenson, Ronninge, and Sven Bertil Simonsson, Tyresco, both of Sweden, assignors to Aktiebolaget Electrolux, Sweden

Filed Jan. 16, 1976, Ser. No. 649,691
Claims priority, application Sweden, Jan. 20, 1975, 7500558
Int. Cl.[2] A47L *9/14*
U.S. Cl. 15—339 **7 Claims**



1. A combination dust container and a latching means for a vacuum cleaner comprising said dust container having an air pervious portion provided with an inlet opening for the reception of dust laden air and an attachment plate, said plate being of a relatively rigid material, a two-part vacuum cleaner housing, a latching hook and keeper member on said two-part housing whereby when said dust container is inserted in one part of said two-part housing with its attachment plate located between said two parts, a lug projecting from a peripheral surface of said attachment plate is provided with a portion that acts as an intermediate filler panel when said latching hook on one part of said two-part housing engages one side of said lug while the keeper member engages the opposite side thereof to retain said two-part housing in a closed position, said closed position indicating that the dust container is in place in said one part of said vacuum cleaner housing.

4,044,422

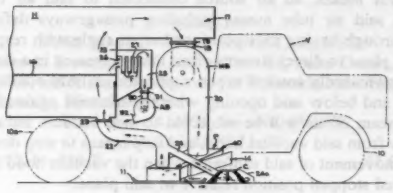
SWEEPER PICKUP HOOD WITH AIR LOCK

Gregory J. Larsen, Claremont, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 8, 1976, Ser. No. 647,521
Int. Cl.[2] A47L *5/14*
U.S. Cl. 15—340 **13 Claims**

1. In a street sweeper of the type comprising a vehicle mounted hopper, a blower and debris pickup means comprising a hood extending transversely across the swept surface; said hood having an air line for delivering air-entrained debris to the hopper, and flexible, surface engaging sealing flaps; the improvement comprising a tunnel connecting the interior of the hood with ambience having a forwardly opening entrance for admitting large articles of debris, air lock means in said

tunnel for accommodating the passage of large articles of debris through said tunnel while maintaining an air seal between the ambience and the interior of said hood, air lock operator means for cyclically operating said air lock means to



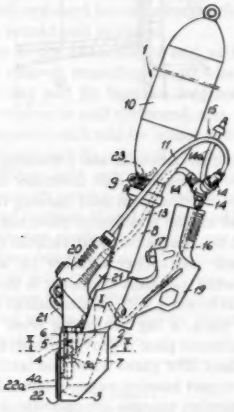
pass said debris from the ambience to the interior of the hood, said debris pickup means including deflector means engaging the swept surface for windrowing large articles of debris into the entrance of said tunnel.

4,044,423

PNEUMATIC CLEANER PARTICULARLY FOR CLEANING ELEMENTS OF TEXTILE MACHINERY

Giuseppe Gaiardelli, via Bertacchi, 15, Parabiago (Prov. of Milan), Italy

Filed Dec. 16, 1974, Ser. No. 533,384
Claims priority, application Italy, Dec. 27, 1973, 32319/73
Int. Cl.[2] A47L *5/18*
U.S. Cl. 15—345 **1 Claim**



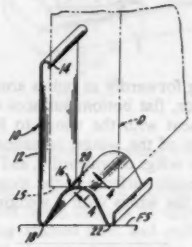
1. A pneumatic cleaner, particularly for cleaning turbines of twisting machines, comprising a suction head having a suction duct and a front surface defining a conical suction mouth communicating with said suction duct, said conical suction mouth sloping from said front surface toward said suction duct, a nozzle inside said suction duct and means for connecting said nozzle to a source of compressed air, said nozzle being oriented to generate an air jet inside said suction duct directed opposite to said suction mouth for generating suction at said suction mouth and inside said suction duct, a first passage within said suction head separate from said suction duct and having an air blast nozzle opening substantially at the peripheral portion of said conical suction mouth and directed with an axis crossing the axis of said conical suction mouth at a point outside of said suction head for creating an air jet centrally oriented into the object to be cleaned, a second passage within said suction head separate from said first passage and from said suction duct and having an air blast nozzle opening into said conical suction mouth in a direction inclined with respect to said front surface and having an axis skew with respect to the axis of said conical suction mouth for creating a vortical air movement inside the object to be cleaned, means for connecting said first and second passage to a source of compressed air, means on said front surface for geometrical connection of said head with the object to be cleaned, and a collecting container at the outlet of said suction duct, whereby simultaneous air ejection from said air blast nozzles causes vortical dislodgement of foreign material from the object to be cleaned to the center thereof while air ejection from said nozzle inside said suction duct causes suction of the dislodged material through said suction duct to said collecting container.

4,044,424

DOOR STOP

Anthony M. Sasgen, 1S 174 Ingersoll Lane, Villa Park, Ill. 60181

Filed Apr. 21, 1976, Ser. No. 678,914
Int. Cl.[2] E05C *17/54*
U.S. Cl. 16—85 **3 Claims**



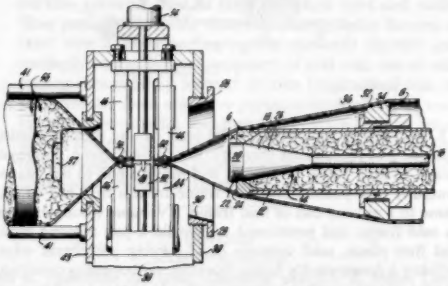
1. A one-piece door stop of metal comprising a flat vertical flange adapted to bear against one side of the door and an upwardly convex leg integral with the lower end of said flange and joined thereto by a bend and, in which the free end of the flange and leg are each defined by a bent-over head extending the width thereof.

4,044,425

PRODUCT STUFFING APPARATUS AND METHOD

Joseph Anthony Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 17, 1976, Ser. No. 724,255
Int. Cl.[2] A22C *11/02*; B65B *1/24*
U.S. Cl. 17—35 **14 Claims**



13. A method for stuffing a casing with product to produce stuffed casings with product-free closure zones which comprises:

a. sheathing a casing onto a stuffing horn, said horn having an inlet end and a discharge end, and the fore end of the

casing proximal the discharge end of the horn being closed;

b. supplying a pressurized flowable viscous product at the inlet end of the stuffing horn and releasing said product from the discharge end of said stuffing horn to progressively stuff the casing;

c. stopping the flow of pressurized product after a predetermined length of casing has been stuffed;

d. compacting the product at the trailing end of the casing to produce a recess therein and severing the product at the discharge end of the stuffing horn;

e. advancing the casing over the discharge end of said stuffing horn so as to provide a product-free closure zone in the casing trailing the end of the stuffed product; and

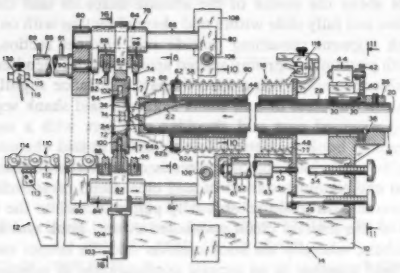
f. applying a closure at the product-free closure zone of said casing at the aft end of the stuffed product.

4,044,426

STUFFING APPARATUS

Vytautas Kupcikevicius, Chicago, and Anton LeRoy Mika, Downers Grove, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,252
Int. Cl.² A22C *11/02*
U.S. Cl. 17—49 **31 Claims**



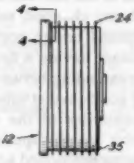
1. An apparatus for controlling the uniformity of stuffed diameter and conformation of the terminal ends of an encased product comprising in combination, a frame; a stuffing horn assembly including a central support tube having an inlet end and a discharge end for conveying emulsion from a supply source, an emulsion cut-off tube rotatably mounted with respect to said support tube and a sleeve means axially movably mounted with respect to said support tube and adapted to mount and secure a shirred tubular casing on said sleeve means, and emulsion cut-off means disposed at the discharge end of said support tube to control the flow of emulsion into a mounted casing; snubbing means associated with said stuffing horn assembly and adapted to be partially advanced over and retracted from said emulsion cut-off tube and further adapted to provide a closure means adapted for enclosing an encased product after a predetermined stuffing length; motive means to operate said sleeve means and snubbing means to regulate the position of said snubbing means over said emulsion cut-off tube and the position of said sleeve means relative to said snubbing means; and control means operatively associated with said stuffing horn assembly and said snubbing means to selectively control a cycle of successive stuffing and closing operations, thereby producing a stuffed closed encased product of predetermined length and diameter with controlled shape of the leading and trailing ends of said product.

4,044,427

COMBER ROLL

Albert M. Ankrom, and John T. Vernon, both of Sanford, N.C., assignors to Rogers Corporation, Rogers, Conn.

Filed May 21, 1976, Ser. No. 688,640
Int. Cl.² D01G *15/84*
U.S. Cl. 19—97 **2 Claims**



1. A comber roll comprising:

a molded plastic core, said core having a spirally grooved cylindrical portion of constant diameter, said core further having an axial passage for receiving a rotary drive shaft and a pair of parallel end faces, said end faces being oriented transversely to the axis of said core cylindrical portion;

a plurality of equally spaced notches in at least a first of said core end faces, said notches and the core segments therebetween defining vanes to establish air currents for directing debris away from said roll;

a flat card clothing wire positioned on edge in said groove in said core cylindrical portion, said wire having regularly spaced teeth in its outwardly disposed edge; and

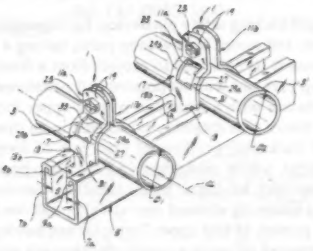
a wear-resistant coating on at least the toothed portion of said wire, said coating including diamond particles.

4,044,428

CONDUIT CLAMP

Joseph W. Kowalski, Florissant, Mo., assignor to B-Line Systems, Inc., Highland, Ill.

Filed Sept. 8, 1975, Ser. No. 611,529
Int. Cl.² F16L *3/08*; B65D *67/02*
U.S. Cl. 24—16 R **2 Claims**



1. A clamp for clamping a member of generally circular cross-section, such as a conduit or the like, to a channel having side flanges each having an inwardly directed, hook-shaped lip defining a slot therebetween with said member extending generally perpendicularly to said channel and engaging the outer edges of said lips, said clamp being adapted to clamp any of a plurality of said members having outer diameters ranging from a specified minimum diameter to a specified maximum diameter, said clamp comprising a pair of clamp straps, one for each side of the member, each of which comprises a generally flat stem portion of a width less than the width of said slot, and an ear at each lateral side of said stem extending out beyond a respective side of the stem for engagement with one of said lips, an intermediate portion bent out of the plane of said stem

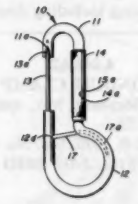
to extend around and grip a portion of the surface of said member to be clamped, an outer end portion, a transition between said intermediate and outer end portions, and means engageable with said outer end portions for drawing together said straps on opposite sides of said member, said intermediate portion of each strap being formed to be selectively weakened along a part thereof so as to enable said part of said intermediate portion to conform to the curvature of the outer surface of the conduit member being clamped, said intermediate portion including a pair of spaced bridge portions defining a cutout therebetween, said cutout having a first or lower edge and a second or upper edge extending between said bridge portions, said lower edge being positioned at substantially the same level as the longitudinal centerline of the conduit member being clamped when the latter has said specified minimum diameter and said upper edge being positioned adjacent said transition so that said bridge portions extend along said weakened part of said intermediate portion and so that said bridge portions are bendable so as to conform to the curvature of the outer surface of said conduit member upon said straps being drawn together, and said bridge portions having a width such that they have a tensile strength which only slightly exceeds the tensile strength of said ears so that upon application of a force to pull said conduit member away from said channel said ears will fail prior to failure of said bridge portions.

4,044,429

LOCKING SAFETY PIN AND KEY CARRIER

Robert W. Wagner, 1102 Lowenhill St., Pittsburgh, Pa. 15216

Filed Sept. 7, 1976, Ser. No. 720,753
Int. Cl.[2] A44B *9/10*
U.S. Cl. 24—156 **15 Claims**



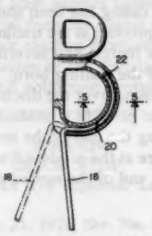
1. In a self-locking safety pin device, having a pair of cooperating upper and lower hollow loop parts, having a pointed pin part secured at its back end to project from a front end of the lower loop part and with its pointed end positioned in a cooperative relation with a front end of said upper loop part, and having a sleeve part rotatably positioned in an operating relation over back end portions of said pair of loop parts, the improvement which comprises, a back end portion of said upper loop part having a hole extending tranversely therethrough, a camming element operatively positioned within the back end portion of said upper loop part and having a cam end portion adapted to project outwardly through said hole, said sleeve part having a closed-end spiral-shaped guide slot portion in its wall into which said cam end portion of said element is adapted to extend for guided movement therealong to raise said upper loop part with respect to said lower loop part to a clearing position with respect to the pointed end of said pin part when said sleeve part is manually forwardly rotated with respect to said upper loop part to advance said cam end portion from a lower position to an upper position along said slot portion and to then swing said upper loop part to a sidewise-open position with respect to the pointed end of said pin part when the manual forward rotation of said sleeve part is continued, and a spring operatively positioned within the back end portion of said lower loop part and connected to said sleeve part to flexibly resist manual forward rotation of said sleeve part.

4,044,430

CLASP FOR JEWELRY CHAIN

Bari Bing, 128 W. Caranetta Terrace, and Barbara S. Sloan, 1425 Cedarview Ave., both of Lakewood, N.J. 08701

Filed Oct. 6, 1975, Ser. No. 619,836
Int. Cl.[2] A44B *19/00*
U.S. Cl. 24—201 R **2 Claims**



1. A clasp for jewelry chains comprising a hook member and a keeper member, said hook member having a shank segment and a hook segment, said hook segment being arcuate in shape and having a distal end, said keeper member comprising an arcuately shaped enclosed channel section, the arcuate shape of said channel section conforming to the arcuate shape of said hook segment, one end of said arcuately shaped channel section being closed and the other end terminating in an open mouth portion, said mouth portion being adapted to receive the distal end of said hook segment, said channel section and said hook segment cooperating to permit said hook member to pivot about the center of the arcuate shape of said channel section and fully slide within said channel section with only the shank segment remaining outside said channel section, said mouth portion comprising spaced apart shoulder members, the shoulder members being spaced apart a distance slightly less than the thickness of said shank segment, said shank segment being received past said shoulder members with a snap fit when said hook segment is fully inserted in said channel section, wherein said hook member is of a length such that its distal end terminates short of said closed end of said channel section in a direction substantially perpendicular to the direction of the jewelry chain connected at said hook and keeper members, whereby the hook member and the keeper member are held together in an arcuate configuration of substantially less circumference than a circle by complete mating of said hook segment with said channel section for dynamic tension at the distal end of the hook member, and by said snap fit.

4,044,431

SLIDE FASTENER AND METHOD AND APPARATUS OF MANUFACTURE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Jan. 9, 1975, Ser. No. 539,802
Int. Cl.[2] B29D *5/00*
U.S. Cl. 24—205.13 C **20 Claims**

9. A method of manufacturing an improved chain for a slide fastener comprising the steps of

forming a slide fastener chain having a pair of planarly disposed tapes of a heat shrinkable thermoplastic material and a pair of rows of interlocking spaced engaging elements secured to respective adjacent edges of the pair of tapes,

advancing the slide fastener chain continuously though a sensing station,

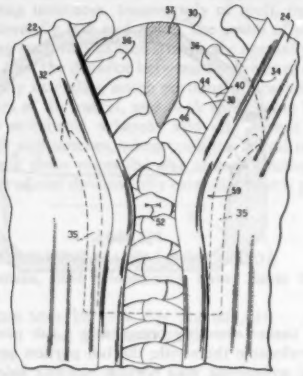
sensing the number of interlocking spaced engaging elements per unit length of the chain as the slide fastener chain passes through the sensing station,

heating the chain to the glass transistion temperature of the thermoplastic material,

passing the slide fastener chain between first and second pairs of rollers which grip the chain at spaced points,

driving the first pair of rollers at a constant speed,

driving the second pair of rollers at a variable speed changed in accordance with a deviation of the number of interlocking spaced engaging elements per unit length sensed at the



sensing station from a selected number of interlocking elements per unit length to produce a desired uniform spacing of interlocking engaging elements throughout the length of the slide fastener chain, and

cooling the slide fastener chain having uniform spacing of interlocking engaging elements.

4,044,432

NET JOINTING STRUCTURE

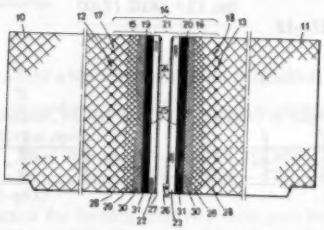
Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Mar. 11, 1976, Ser. No. 665,707

Claims priority, application Japan, Mar. 13, 1975, 50-34201

Int. Cl.[2] A44B *19/40, 19/00*

U.S. Cl. 24—205.16 R **8 Claims**



1. A net jointing structure for releaseably joining a pair of nets together, comprising; a pair of elongate net strips each having first and second longitudinal opposite edges and having a mesh size progressively decreasing toward said second edge, the first edge of each net strip being connected to a corresponding end of each of said nets; and a sliding claps fastener including a pair of stringers each having on and along one longitudinal edge a row of interlocking elements and secured at the opposite longitudinal edge to the second edge of a corresponding net strip, and a slider slidably mounted on said rows of interlocking elements for coupling and uncoupling same to correspondingly connect and disconnect said pair of stringers.

4,044,433

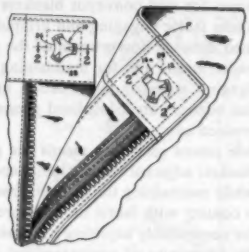
WAISTBAND FASTENER HAVING SUBSTANTIALLY IDENTICAL PARTS

William D. Aureli, Watertown, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Dec. 22, 1976, Ser. No. 753,467

Int. Cl.[2] A44G *13/00*

U.S. Cl. 24—227 **7 Claims**



1. A waistband assembly comprising a waistband outer flap and an inner flap, the outer surface of the inner flap and the inner surface of the outer flap having affixed thereto respectively a pair of fastener halves, the halves being substantially identical, each half comprising a Y-shaped body having three legs distributed uniformly about the center of the body, the bodies of the two halves being in identical rotary orientation when the units are aligned with one of the legs of each being pointed in the direction of the outer flap and the other legs directed substantially up and down so that one of the legs on the outer flap half may be hooked between the said other legs of the inner flap half, all of the legs except said one leg of the unit on the outer flap being secured to the respective flaps.

4,044,434

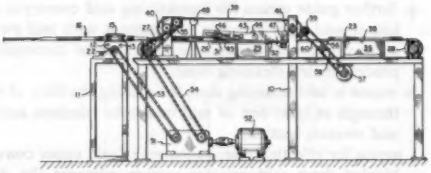
APPARATUS FOR PROCESSING SWEATER SECTIONS AND THE LIKE

Clifford Chandler Bryan, Statesville, N.C., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Continuation-in-part of Ser. No. 488,672, July 15, 1974, abandoned. This application July 10, 1975, Ser. No. 594,718

Int. Cl.[2] D06C *5/00*

U.S. Cl. 26—18.5 **13 Claims**



1. Apparatus for processing tubular knitted fabrics in continuous or piece form, which comprises

a. belt spreader means for engaging the fabric internally and distending it to flat form and to predetermined, uniform width,

b. lower endless conveyor blanket means having a first portion disposed adjacent and below the discharge end of the spreader means and having a second portion extending

downstream from the discharge end of the spreader means,

c. an upper endless conveyor blanket means having a first portion disposed adjacent and above the discharge end of the spreader means and extending above the lower conveyor blanket,

d. said conveyor blanket means including flexible conveyor blankets formed of a porous, non-metallic, hydrophobic material,

e. guide means for said conveyor blankets for guiding said blankets into fabric engaging and gripping relation a predetermined distance downstream of the discharge end of the spreader means and for maintaining said blankets in such engaging and gripping relation in the absence of substantial concentrated, localized pressure throughout a predetermined zone,

f. said guide means including means for guiding the conveyor blankets adjacent the discharge end of the spreader means while maintaining the blankets free of concentrated pressure contact with fabric on said spreader means,

g. means for controllably adjusting the position of said guide means for adjusting said predetermined distance,

h. means for steaming the fabric while it is being conveyed through said zone and is engaged and gripped by said conveyor blankets, and

i. means for removing moisture from said conveyor blankets subsequent to the steaming of the fabric and in advance of the re-engagement of the conveyor blankets with the fabric.

7. Apparatus for processing tubular knitted sweater sections in separated form, which comprises

a. means for supplying an individual sweater section in substantially dry form,

b. generally flat belt spreader means for engaging the section internally, distending it to predetermined uniform width, and advancing the section,

c. upper and lower flat endless conveyor blankets straddling the discharge end portion of said spreader means for receiving fabric discharged therefrom,

d. first guide means adjacent but spaced from the discharge end of said spreader means for guiding said conveyor blankets into light, uniform, across the width gripping engagement with sweater sections discharged from said spreading means,

e. said guide means including means for guiding the conveyor blankets adjacent the discharge end of the spreader means while maintaining the blankets free of concentrated pressure contact with fabric on said spreader means,

f. means for controllably adjusting the relationship of said first guide means to the discharge end of the spreader,

g. further guide means for maintaining said conveyor blankets in said light gripping engagement with said sweater section from the commencement thereof throughout a predetermined steaming zone,

h. means in said steaming zone for causing the flow of steam through at least one of said conveyor blankets and into said sweater section,

i. means for effecting disengagement of said upper conveyor blanket from said sweater section adjacent the downstream end of said steaming zone,

j. means for directing a flow of air through said sweater section and through said lower conveyor blanket in a predetermined cooling and moisture removal zone,

k. means for mounting and guiding said spreader means and said conveyor blankets to maintain said sweater section free of any substantial, concentrated, localized pressures from at least immediately upstream of said steaming zone to at least immediately downstream of said cooling zone, and

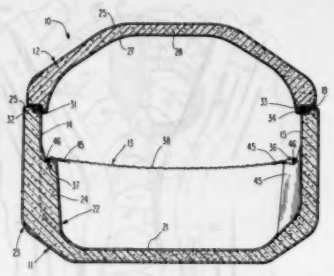
l. means for removing moisture from said upper conveyor blanket downstream of said steaming zone and in advance of said spreader means.

4,044,435

CASKET WITH SUPPORTED PALLET

Hugh Acton, Augusta, Mich., assignor to Boyertown Burial Casket Company, Boyertown, Pa.

Filed Sept. 30, 1975, Ser. No. 618,147
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—2 **4 Claims**



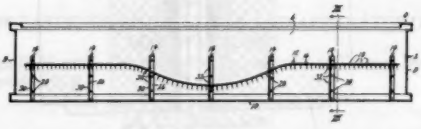
1. A casket assembly comprising a tub portion and a lid portion closable therewith; the tub portion comprising a peripheral upstanding wall portion defining sidewalls and end walls, the wall portion extending upwardly of and about a bottom wall portion, pallet support means disposed inwardly of and about the interior of said upstanding wall portion, and including a pallet for disposition in said tub, said pallet having engagement portions at its periphery for engagement with and support by said pallet support means, said pallet also including supporting surface means extending between said engagement portions and in generally horizontal planar disposition upon engagement of said engagement portions with associated said pallet support means about said wall portion wherein said supporting surface means comprises a flexible sheet-like member and wherein said engagement means comprise rod means extending about the periphery of said supporting surface means and wherein said sheet-like member includes tunnel portions at its periphery in which said rod means are disposed.

4,044,436

CASKET SUSPENSION

John H. Patrick, Carthage, Mo., assignor to Flex-O-Lators, Inc., Carthage, Mo.

Filed Apr. 28, 1976, Ser. No. 681,169
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—12 **4 Claims**



1. A device for suspending a body in a casket, said device comprising:

a. a series of brackets fixed to the interior surface of said casket in spaced relation along substantially the entire length of said casket along each side of said casket, each of said brackets comprising a vertically disposed member projecting inwardly from the casket side to which it is affixed, and having a series of vertically spaced apart notches formed therein, each of said notches opening through the inner edge of said vertical bracket member, and extending outwardly and then downwardly from said opening, the downwardly extending portion of each of said bracket notches being inclined downwardly and inwardly relative to said casket, and

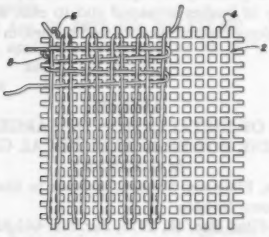
b. a deck sheet flexible transversely of its plane and of sufficient area to cover substantially the entire interior horizontal area of said casket, said deck sheet including a pair of flexible side strands disposed respectively along the opposite sides thereof and each engageable in any selected notch of each bracket at the corresponding side of the casket, whereby said deck sheet is supported, said side strand being insertable, transversely of itself, outwardly and downwardly into said notch, the width of said deck sheet being such that its side strands are normally spaced apart less than the distance between the lower ends of the downwardly extending notch portions of brackets at opposite sides of the casket, said deck sheet being laterally resiliently strechable, whereby said side strands may be engaged in said notches, whereupon the lateral resilience of said deck sheet urges the side strands thereof to the lower ends of said downwardly extending notch portions.

4,044,437

RESILIENT HAND LOOM GRID

Ruth B. Ebenstein, 2685 Glendessary Lane, Santa Barbara, Calif. 93105

Filed Mar. 19, 1976, Ser. No. 668,431
Int. Cl.² D03D *29/00*
U.S. Cl. 28—151 **7 Claims**



1. A loom adapted to hold threads interwoven to form a fabric, the loom including a resilient sheet incorporating a series of regularly spaced openings to define a grid, the sheet being sufficiently flexible to accommodate a reduction in the fabric's span as the threads are interwoven, and peripheral bars attached to, co-planar with and projecting from the resilient sheet, the bars being the size and location to permit threads to be wrapped about them, the peripheral bars being formed of a resilient material.

4,044,438

APPARATUS AND METHOD FOR FORMING YARN BALLS

John R. Everhart, Mount Airy, N.C., assignor to Renfro Corporation, Mount Airy, N.C.

Filed July 19, 1976, Ser. No. 706,904
Int. Cl.² D04D *7/06*
U.S. Cl. 28—147 **14 Claims**

1. Apparatus for forming relatively short yarn bundles for use in making yarn balls characterized by a series of successive work stations at which the various procedures incident to formation of the yarn bundles are performed, said apparatus comprising

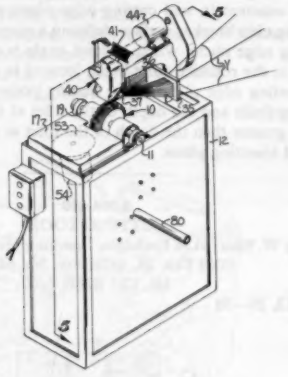
a. means for receiving a multiplicity of yarn and arranging those yarns into a generally parallel, composite arrangement,

b. means operatively associated with and in spaced relation to said yarn arranging means for sequentially applying a binder element around the composite yarn arrangement at predetermined points spaced apart along the length of the yarns a distance equal to the desired length of the yarn bundles being formed;

c. cutting means disposed in spaced relation to said binder applying means for sequentially severing the composite yarn arrangement between adjacent binder elements to form the composite yarn arrangement into relatively short yarn bundles; and

d. feeding means for feeding the composite yarn arrangement from said yarn arranging means to said binder applying means and then to said cutting means, said feeding means including

1. spaced apart gripper means for receiving and grippingly



engaging successive incremental lengths of the composite yarn arrangement to maintain the yarns in the composite arrangement until the binder elements are applied and to hold the bound lengths in position for severing to form the yarn bundles, and

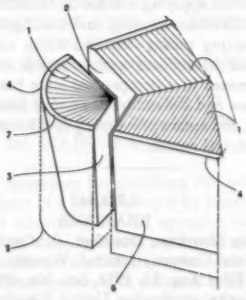
2. drive means for successively indexing said spaced apart gripper means into successive operative association with said yarn arranging means, binder applying means and cutting means.

4,044,439

CUTTING PLATE WITH CHIP BREAKERS

Gerard Romagnolo, Eybens, France, assignor to Ugine Carbone, Grenoble, France

Continuation-in-part of Ser. No. 578,821, May 19, 1975, abandoned. This application July 22, 1976, Ser. No. 707,857
Claims priority, application France, June 14, 1974, 74.20644
Int. Cl.² B26D *1/00*
U.S. Cl. 29—95 R **5 Claims**



1. A cutting plate adapted to be connected to the body of a tool for machining metal pieces, said plate having an upper surface having a generally planar face portion, a plurality of planar sides generally normal to said upper generally planar face portion, said sides joining each other in at least a rounded cutting point having a cutting edge at a cutting edge plane which is generally parallel to, and below, the upper generally

planar face portion, a chip breaker groove in the upper surface defined by a downwardly inwardly declining first planar surface extending from adjacent the cutting edge to a rounded fillet and then extending upwardly as a chip breaker surface that terminates at a level above said cutting edge plane as a central planar chip breaker island portion of said upper generally planar face portion, said downwardly declining surface being planar all along the cutting edge of the planar sides and conical adjacent the rounded cutting point planes at a first angle constant to said cutting edge plane, said upwardly extending chip breaker surface defining a second angle with said cutting edge plane, which second angle is constant, a lowest point in the rounded fillet being located in a plane normal to the cutting edge plane of the cutting point and bisecting the cutting point and the depth of the fillet at the bisecting plane being greater than the depth of the fillet at a point other than at said bisecting plane.

4,044,440

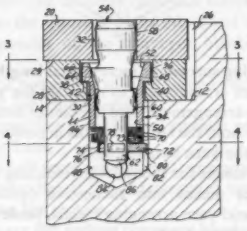
CUTTING TOOL

Henry W. Stier, 8134 Lochdale, Dearborn Heights, Mich. 48127

Filed Feb. 25, 1976, Ser. No. 661,125

Int. Cl.[2] B26D *1/00*

U.S. Cl. 29—96 **22 Claims**



1. In a cutting tool comprising in combination a support member, a pocket on one end of the support member, a removable cutting bit disposed in the pocket with a portion thereof exposed for cutting engagement with a workpiece, and means for holding the cutting bit in the pocket, the improvement of said holding means comprising a cylindrical recess in said support member, a pin disposed in said cylindrical recess and having an end portion in engagement with a surface of said cutting bit, a laterally projecting portion on said pin having an end in engagement with an inner surface of said cylindrical recess, means for applying a force on the other end of said pin in a general direction holding said cutting bit in said pocket comprising spring means disposed about said pin proximate said other end thereof and spring retainer means maintaining said spring means in a compressed state between said spring retainer means and a shoulder abutment formed in said cylindrical recess, and means preventing rotation of said pin relative to said cylindrical recess.

4,044,441

BEARINGS

William Craig Morrison, Doonfoot, Scotland, assignor to The Glacier Metal Company Limited, Wembly, England

Filed Aug. 12, 1974, Ser. No. 496,827

Claims priority, application United Kingdom, Aug. 15, 1973, 39538/73

Int. Cl.[2] B21D *53/10*

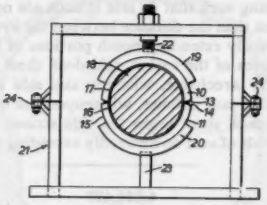
U.S. Cl. 29—149.5 R **4 Claims**

1. A method of producing a bearing in which a bush for insertion in a bearing housing is produced by the steps of

pressing from flat sheet material comprising a strong backing and a layer of bearing lining, two semi-cylindrical bearing bush segments each segment having a convex surface, a concave inner surface, a pair of part annular end faces, and a pair of side faces;

assemblying said bearing bush segments to form a complete annular bush pre-assembly in which side faces of adjacent segments are close to one another but separated by a V-groove;

welding together adjacent segments of said pre-assembly by deposition of metal in the V-grooves in contact with the



side faces of the backings but not in contact with the linings to provide a complete self-supporting bush having an essentially continuous internal cylindrical bearing surface; and

then inserting the bush in the bearing housing in which method a plurality of segments are supported to form a plurality of bushes arranged end to end, and are joined, except along the end faces of said bushes, in a single operation.

4,044,442

METHOD OF INSTALLATION OF LARGE CAPACITY GAS-TURBINE POWERED ELECTRICAL GENERATING MACHINERY

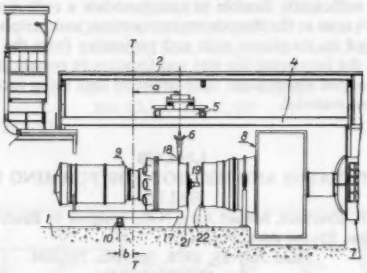
Arne Carlson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Dec. 18, 1975, Ser. No. 642,021

Claims priority, application Sweden, Dec. 23, 1974, 7416223

Int. Cl.[2] B23P *15/04*

U.S. Cl. 29—156.4 R **4 Claims**



1. A method of installing in a machinery hall a gas turbine apparatus for coupling mechanically to an electric power generator, the gas turbine comprising a power turbine unit whose output shaft is coupled to the input shaft of the generator and also comprising as a separate unit a gas generator unit which is to be connected to the power turbine with a gas-tight fitting by means of respective cooperating flanges and also with a protruding axial shaft on the gas generator which mates with a bearing in the power turbine unit, said method comprising the steps of:

fixedly installing on supporting means in the machinery hall the power turbine unit and coupling said power turbine unit to the generator with the said bearing of said power turbine unit being oriented horizontally for coaxial alignment with said shaft of said gas generator,

transporting the gas generator into the machinery hall and to

the site of its assembly with the power turbine unit by rolling the gas generator horizontally on a plurality of roller means and with its entire weight supported in static equilibrium on the roller means,

lifting one end of the gas generator slightly so as to permit the removal from thereunder of sufficient of the roller means to ensure that the roller means remaining do not provide static equilibrium of the gas generator,

concurrently with the lifting step, supporting a portion of the weight of the gas generator from an overhead travelling crane which is attached to the gas generator at a point to provide, in cooperation with said remaining roller means, static equilibrium support of the gas generator,

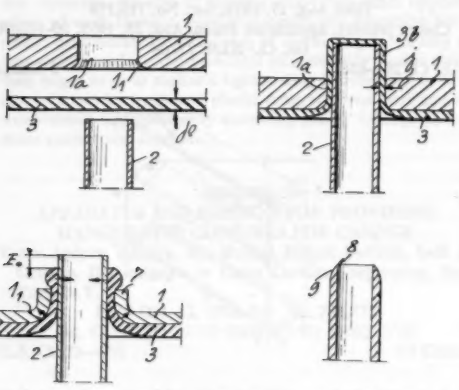
and repeatedly adjusting the height of said roller means and also the extent of lift provided by the travelling crane while concurrently moving said gas generator horizontally to bring the cooperating flanges on the gas generator and power turbine unit into abutting relationship with each other while said shaft concurrently is coaxially aligned with said bearing.

4,044,443

METHOD FOR ASSEMBLING TUBES AND TUBE PLATES AND PRODUCT RESULTING THEREFROM

André Chartet, Meudon, France, assignor to Societe Anonyme des Usines Chausson

Filed Apr. 28, 1975, Ser. No. 572,450
Claims priority, application France, May 30, 1974, 74.18840
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.4 **7 Claims**



1. A method of assembling at least one tube having an outer wall in a tube plate comprising the steps of:

forming at least one tube passage in said plate, said tube passage having a shape corresponding to that of said tube and a cross-section slightly greater than that of said tube;

placing a flexible, resilient sheet of substantially uniform thickness on one side of and in a planar coextensive relationship with said tube plate;

bringing an end of said tube into contact with said flexible, resilient sheet;

forcibly inserting said tube while in contact with said flexible, resilient sheet into said tube passage of said tube plate and beyond, a portion of said flexible, resilient sheet thus covering an end portion of said tube which extends beyond said plate; and

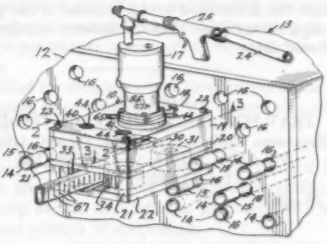
cutting said portion of said sheet, whereby the inner stress of the material constituting said sheet restricts said portion of said sheet extending beyond said tube plate while forming a stressed flange pressing said outer wall of said tube and bearing on said tube plate.

4,044,444

TUBE TRAVELER

Richard T. Harris, Newport, Mich., assignor to William W. Sismore, Newport, Mich., a part interest

Filed Feb. 12, 1976, Ser. No. 657,357
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—727 **5 Claims**



1. A tube extractor comprising, in combination, a housing having a passageway extending therethrough along which a tube is advanced, first and second pairs of drivers, four shafts, means attaching each of said drivers to a different one of said shafts, means mounting said shafts in said housing for rotation about parallel axes which extend perpendicular to said passageway with a first driver in each pair positioned on one side of said passageway and a second driver in each pair positioned on an opposite side of said passageway, means on said drivers extending into said passageway for deformably engaging sides of a tube in said passageway, and motor means for simultaneously rotating all of said drivers at the same speed for advancing a tube along said passageway, said rotating means including means for rotating said first drivers in each pair in a predetermined direction and means for rotating said second drivers in each pair in the opposite direction.

4,044,445

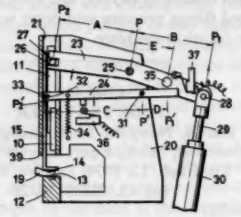
APPARATUS FOR ATTACHING END STOPS TO FASTENER STRINGERS WITH A SAFETY STOP FUNCTION

Hisashi Douri, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Nov. 6, 1975, Ser. No. 629,527
Claims priority, application Japan, Nov. 15, 1974, 49-132356
Int. Cl.[2] H01H *3/16*
U.S. Cl. 29—706 **4 Claims**

1. In combination apparatus for attaching end stops to fastener stringers by means of a punch carried by a punch holder and arranged over a stationary die for up-and-down motion relative to same, and the combination of a sensor arranged over said die for up-and-down motion relative to same, a first lever pivotally supported intermediate both ends and coupled at one end to said punch holder, actuator means coupled to the other end of said first lever to impart up-and-down motion to said punch via said punch holder, a second lever pivotally supported intermediate both ends and coupled at one end to said sensor, spring means urging the other end of said second lever into engagement with said first lever whereby said second lever follows the motion of said first lever to impart up-and-down motion to said sensor, said first and second levers being so constructed and arranged in relation to each other that said

sensor completes its downward stroke earlier than said punch, and detector means effective to cause said actuator means to prevent the full descent of said punch in event said sensor fails



to complete the downward stroke because of the presence of some foreign matter other than the fastener stringers between itself and said die.

4,044,446

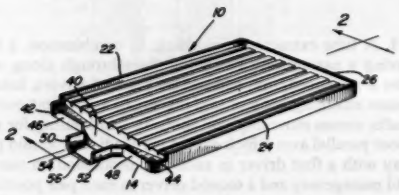
TRAY FOR STRING JEWELRY ITEMS

Morton Segerman, 8950 Chickamagua, Tucson, Ariz. 85710

Filed Feb. 2, 1976, Ser. No. 654,342

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—241 **11 Claims**



1. A tray for stringing jewelry items, said tray comprising a horizontal panel member including an upper surface having a plurality of generally parallel elongated upwardly opening grooves formed therein and opening outwardly of one end of said surface, and means defining an upwardly facing guide surface extending transversely of said grooves, spaced endwise outwardly of said one end of said upper surface and generally horizontally aligned with said grooves, said guide surface including portions thereof spaced endwise outwardly of and generally horizontally aligned with at least two of said grooves, said panel member including an upstanding curb projecting above said surface at the ends of said grooves remote from said guide surface closing said remote ends of said grooves.

4,044,447

METHOD OF SIMULTANEOUSLY DRAWING A NUMBER OF WIRE MEMBERS

Koichi Hamada, Tokyo; Kaoru Kikubu, Sakai, and Tsunehiro Itoh, Hirakata, all of Japan, assignors to Nippon Seisen, Co., Ltd., Osaka, Japan

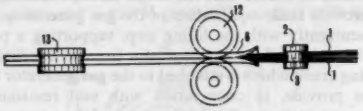
Filed Mar. 7, 1972, Ser. No. 231,152

Claims priority, application Japan, Mar. 2, 1971, 46-10864

Int. Cl.[2] B23P *17/00*; B21C *1/00*

U.S. Cl. 29—419 R **7 Claims**

1. In a method for manufacturing filament of the type comprising gathering and bundling a plurality of wire members in parallel relationship to one another while feeding said wire members in a predetermined direction, feeding a band-shaped armoring of medium carbon steel out of a reel in parallel with said bundled wire members, said band-shaped armoring being formed into the shape of an upwardly directed conduit, storing the gathered plurality of wire members within said armoring formed into the shape of a conduit such that each wire member is parallel to the longitudinal axis of said conduit, enveloping said wire members in said conduit by closing said armoring such that said wire members are compressed by forces exerted by said armoring, thus tightly binding said wire members



together forming an enveloped bundle of said wire members, drawing said enveloped bundle by means of dies, and removing said armoring from said wire members, the improvement which comprises:

plating in advance the wire members with a plating material.

4,044,448

METHOD OF ASSEMBLING ARTICLES OF FURNITURE

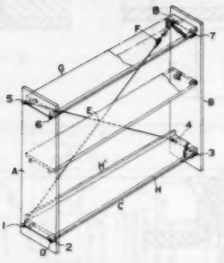
Kazuko Watanabe, 6 of 4 Nishikamata 6, Ohta, Tokyo, and Mitsuko Arai, 12 of 9, Asagaya-minami 3, Suginami, Tokyo, both of Japan

Filed Aug. 17, 1976, Ser. No. 715,178

Claims priority, application Japan, Aug. 25, 1975, 50-102690

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—433 **5 Claims**



1. A method of assembling articles of furniture from a single rope member made of a soft material, combined with assembling members made of a rigid material, comprising the steps of:

passing one end of said single rope member successively through said assembling members, said assembling members arranged in predetermined positional relationships with each other;

forming at least one diagonal intersection of said rope member;

connecting said one end of said rope member to the other end of said rope member through an adjustable stretching means;

applying tension to said rope member by adjusting said adjustable stretching means causing said assembling members to cooperate with each other under pressure; and

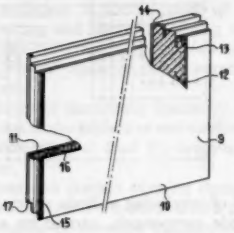
maintaining said rope member at a predetermined tension whereby the rigidity of the structure is retained.

4,044,449

METHOD OF MAKING REFRIGERATING UNITS AND THE LIKE AND PRODUCT THEREOF

Chi Quy Phan, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Feb. 7, 1975, Ser. No. 547,953
Int. Cl.[2] B23P *3/00, 19/04;* B29D *27/04*
U.S. Cl. 29—460 6 Claims



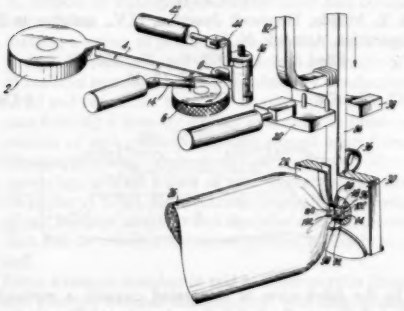
1. In a method of manufacturing refrigerating or refrigerated units which are fabricated from lapped standard modular elements, including a layer of thermally insulating plastic foam formed in situ and having multiple step tiers on two opposite edges of each element, each of said elements constituting a fraction of a wall, bottom or upper portion of a unit, the improvement comprising in the production of said standard modular elements, the step of forming along two other opposite edges of each element respective outwardly extending foam plastic protuberances; and a step of assembling a plurality of thus constructed standard modular elements side by side along their edges so as to realize a tight sealing by effecting an intimate contact between said plastic foam stepwise tiers and by compressing said outwardly extending plastic foam protuberances against one another.

4,044,450

APPARATUS AND METHOD FOR PROVIDING HANGER-CLIP CLOSURES FOR CASINGS

Vytas Andrew Raudys, and Ronald Robert DeVitto, both of Chicago, Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,372
Int. Cl.[2] B21D *39/00;* B23P *11/00;* B23Q *7/10*
U.S. Cl. 29—509 12 Claims



1. An apparatus for securing a tape loop hanger at the gathered end portion of a casing using a substantially U-shaped clip member comprising:

a. means for continuously and successively supplying a predetermined length of tape from a supply source;

b. means for forming a loop hanger in each of said predetermined lengths of tape and supporting each of said tape loop hangers so formed in relative alignment with a gathered end portion of a casing;

c. means for continuously and successively supplying a substantially U-shaped clip in relative alignment with the tape loop hanger and the gathered end portion of the casing, said clip comprising a pair of opposed legs and a crown connecting the corresponding end of said legs; and

d. means for first advancing and projecting said clip onto and about said tape loop hanger, and then advancing said clip and said tape loop hanger into contact with said gathered end portion of the casing and thereafter deforming the legs of said clip to encircle said tape loop hanger and said gathered end portion of the casing so that said tape looper hanger is secured to the gathered end of said casing.

9. A method for securing a tape loop hanger at the gathered end of a casing using a substantially U-shaped clip comprising the steps of:

a. gathering an end portion of a casing;

b. forming a loop hanger having two extended free ends from a predetermined length of tape and positioning said tape loop hanger in substantial alignment with said gathered end portion of said casing;

c. advancing a substantially U-shaped clip having a crown member connecting corresponding ends of two opposed legs into contact with said tape loop hanger so as to initially position said tape loop hanger adjacent the crown member between the legs of said clip;

d. advancing the clip and tape loop hanger into contact with the gathered end portion of said casing; and

e. deforming the legs of said clip to encircle the tape loop hanger and the gathered end portion of the casing so as to secure said tape loop hanger to the gathered end portion of the casing via said clip.

4,044,451

APPARATUS FOR INSERTING WIRES INTO TERMINALS IN MODULAR TYPE CONNECTOR

Edward Denman Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 707,981, July 23, 1976. This application Nov. 11, 1976, Ser. No. 740,996
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—566.4 13 Claims

1. An assembling apparatus for modular electrical connectors comprising:

a frame structure comprising a base section and a head section which is spaced from, and extends parallel to, said base section, connector supporting means on said base section for supporting an elongated electrical connector thereon,

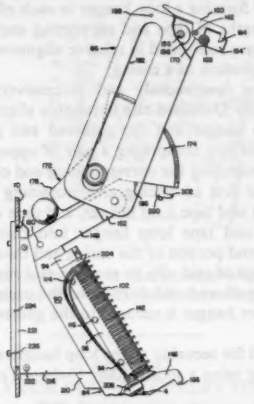
force applying means for applying a force to a connector supported on said supporting means, said force applying means comprising a sector-shaped member having an arcuate surface, said sector shaped member being pivotally mounted in said head section by pivotal mounting means, said pivotal mounting means having an axis which extends normally of said sector shaped member, said arcuate surface having an arc-and-tangent-line relationship to a connector on said supporting surface,

an elongated guide slot means in said head section extending parallel to a connector supported on said supporting means, said pivotal mounting means being movably mounted in said guide slot means, and

actuating means for moving said pivotal mounting means along a rectilinear path defined by said slot means and

simultaneously rotating said sector shaped member with respect to said pivotal axis whereby,

upon placing a connector on said supporting means, moving



said pivotal mounting means along a path defined by said slot means and simultaneously rotating said sector shaped member, said arcuate surface moves progressively over said connector and imposes a force against said connector.

4,044,452

PROCESS FOR MAKING FIELD EFFECT AND BIPOLAR TRANSISTORS ON THE SAME SEMICONDUCTOR CHIP

Shakir Ahmed Abbas, Wappingers Falls, and Robert Charles Dockerty, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1976, Ser. No. 729,937
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **7 Claims**

1. Method for manufacturing an integrated circuit structure having dielectrically isolated regions containing bipolar and field effect transistor devices comprising:

providing a silicon monocrystalline substrate;

etching said silicon in the areas to be the dielectric regions isolating the said field effect transistor devices;

oxidizing the exposed silicon in said regions to form first oxidized areas;

etching said silicon in the areas to be the dielectric regions isolating the said bipolar devices to form a mesa in the center of the etched area;

oxidizing the exposed silicon areas to form a screen oxide area;

ion implanting impurities through said screen oxide areas to form the subcollector for a bipolar device;

growing thick silicon dioxide in said screen oxide areas to completely fill the areas with silicon dioxide and complete said dielectrically isolated regions;

simultaneously forming the source, drain and emitter regions of said devices;

forming gate insulator and gate electrodes for said field effect transistor devices;

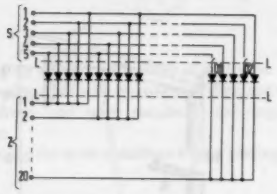
forming electrical contacts to said source, drain, gate, emitter, base and, collector of said devices.

4,044,453

METHOD FOR THE PRODUCTION OF A DIODE MATRIX FOR CHARACTER GENERATORS

Guenther Vorbach, Schwindegg, and Siegfried Kuballa, Puchheim, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 8, 1975, Ser. No. 610,926
Claims priority, application Germany, Sept. 11, 1974, 2443491
Int. Cl.² B01J *17/00*
U.S. Cl. 29—574 **4 Claims**



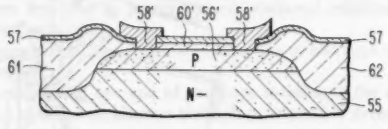
1. A method of producing a diode matrix composed of a plurality of diode components, carried by a plug-in circuit board, and adapted in use to be operatively disposed at selected matrix points forming a predetermined pattern in accordance with the desired matrix programming thereof, for character generators, in particular for the code generator of electronic teleprinters or for a circuit board with optionally differing line configurations, comprising the steps of disposing an individually formed diode, having respective individual lead elements, at each matrix point and connecting the individual diode lead elements to the circuit board to provide an operable diode for each possible operative matrix point of the total design number thereof, with such lead elements providing both the operative electrical and supporting connections between the associated diodes and the circuit board, thereby forming a complete electrically operative diode matrix having a total number of operative diodes in excess to the number of diodes to be operative, in use, in accordance with the desired program, with each diode being so disposed with respect to such board that a portion of at least one of the electrical lead elements connected thereto extending between such diode and the board is sufficiently exposed for possible severance thereat, and programming said matrix in accordance with the desired programming by determining each matrix point, of the total number thereof, at which the diode thereat is to be operative, and rendering all of said excess diodes inoperative by cutting the exposed portion of at least said one exposed lead element of each of said unrequired diodes.

4,044,454

METHOD FOR FORMING INTEGRATED CIRCUIT REGIONS DEFINED BY RECESSED DIELECTRIC ISOLATION

Ingrid E. Magdo, Hopewell Junction, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,636
Int. Cl.² B01J *17/00*
U.S. Cl. 29—578 **6 Claims**



1. In the fabrication of integrated circuits, a method for forming dielectrically isolated regions in a silicon substrate comprising

introducing conductivity-determining impurities into the

substrate to form at least one region of one-type conductivity at the surface of said substrate

forming over at least a part of said surface of said region, a composite mask comprising

a lower layer of silicon dioxide in contact with said surface, and

an upper layer of silicon nitride on said lower layer,

said mask having a plurality of apertures extending therethrough,

etching recesses in the portions of said substrate exposed in said apertures,

thermally oxidizing the recessed portions of said substrate to an extent sufficient to form regions of recessed silicon dioxide abutting and laterally defining said at least one region of one-type conductivity, said mask acting as a barrier to prevent oxidation of the unrecessed surface of said substrate,

providing a layer of electrically insulative material over at least a portion of the surface of said substrate by a processing step comprising at least the removal of said silicon nitride layer,

forming at least one contact opening through said electrically insulative layer to expose at least a portion of said at least one region of one-type conductivity, said contact opening exposing a portion of a region of recessed silicon dioxide abutting said one-type conductivity region and

depositing metal in said contact opening to form a contact to said region of one-type conductivity, said contact overlapping said recessed silicon dioxide.

4,044,455

METHOD OF MAKING A PRINTING HAMMER UNIT

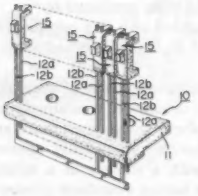
Satoshi Watanabe, Inagi; Atsuo Tsunoda, Fuchu; Takeshi Kimura, and Hitoshi Narita, both of Chichibu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, both of, Japan

Filed May 28, 1976, Ser. No. 690,925

Claims priority, application Japan, June 5, 1975, 50-68028; June 5, 1975, 50-68029; June 5, 1975, 50-68030; June 5, 1975, 50-68031

Int. Cl.² B23P *17/00*

U.S. Cl. 29—592 **17 Claims**



1. A method of making a printing hammer unit comprising the steps of:

a. forming a group of printing hammers by fixedly securing a respective hammer portion to each of a plurality of pairs of resilient members made of electrically conductive material and connected together at connecting portions, and also forming a base by fixedly securing the same onto a portion of said resilient members spaced apart from said hammer portions;

b. removing at least a part of said connecting portions to each pair of break the electrical connection between one of said resilient members and the other resilient member of each pair on which a respective portion is fixedly secured; and

c. fixing a magnet member to said hammer portion formed in said printing hammer forming step, said magnet member fixing step being carried out subsequent to said printing hammers forming step or to said connecting portions removing step.

4,044,456

METHOD FOR THE MANUFACTURE OF A SUPERCONDUCTOR WITH A SUPERCONDUCTIVE INTERMETALLIC COMPOUND OF AT LEAST TWO ELEMENTS

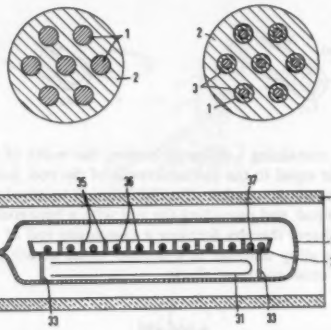
Günther Ziegler; Sigrun Frohmader, both of Erlangen, and Manfred Wilhelm, Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 30, 1975, Ser. No. 573,073

Claims priority, application Germany, May 16, 1974, 2423882

Int. Cl.² H01V *11/00*

U.S. Cl. 29—599 **28 Claims**



1. A method for the manufacture of a superconductor with a superconductive intermetallic compound consisting of at least two chemical elements by steps comprising bringing a ductile structural part made of at least one element of the compound into contact with a second structural part which contains a ductile carrier metal for the remaining elements of the compound; subsequently supplying the remaining elements of the compound to the second structural part at elevated temperature; and diffusing the remaining elements through the second structural part and reacting said remaining elements with said first structural part to form the compound, wherein the improvement comprises performing said step of supplying so as to supply the remaining elements to the second structural part solely by a chemical transport reaction of the type in which said remaining elements are initially converted by a gaseous transport agent in a reversible reaction to form gaseous reaction products and the gaseous reaction products subsequently decomposed in a reversal of the reaction to thereby supply the remaining elements to the second structural part.

4,044,457

METHOD OF FABRICATING COMPOSITE SUPERCONDUCTING WIRE

Bruce P. Strauss, Downers Grove, Ill.; Paul J. Reardon, Princeton, N.J., and Robert H. Remsbottom, Middleton, Wis., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

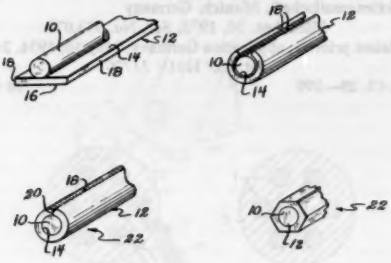
Filed Apr. 1, 1976, Ser. No. 672,575

Int. Cl.² H01V *11/00*

U.S. Cl. 29—599 **8 Claims**

1. In the method for preparing multifilament composite electrical conductors in which a rod of ductile superconducting alloy is provided with an annular sheath of ductile normal metal to form a composite rod, a plurality of composite rods having a hexagonal cross-sectional shape are stacked in parallel into an extrusion can of ductile normal metal to form an assembly, and the assembly is worked to elongate and reduce the cross section of the assembly to a predetermined cross-sec-

tional size, thereby forming a multifilament composite electrical wire, the improvement in the method for preparing the composite rod comprising: bending longitudinally a strip of ductile normal metal around a rod of ductile superconductor alloy so that the longitudinal edges meet, the strip having an inner face which will contact the rod and an outer face, the



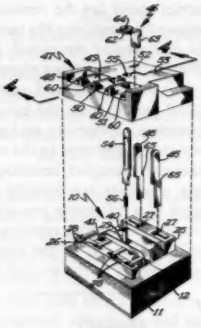
inner face containing a diffusion barrier, the width of the strip being about equal to the circumference of the rod, joining the longitudinal edges together, thereby forming an annular sheath around the rod, and providing the rod with a hexagonal cross-sectional shape, thereby forming a composite rod of a superconducting alloy material in a normal metal sheath having a hexagonal cross-sectional shape.

4,044,458

METHOD OF MAKING A POWER-PACK ASSEMBLY

Luther T. Prince, Jr., Minneapolis, Minn., assignor to Ault Incorporated, Minneapolis, Minn.

Division of Ser. No. 547,781, Feb. 7, 1975, Pat. No. 3,979,707.
This application Apr. 19, 1976, Ser. No. 678,078
Int. Cl.[2] H01F *41/10*
U.S. Cl. 29—605 **3 Claims**



1. The method of simultaneously establishing a mechanical and electrical connection between the windings and multiple terminals of a power-pack assembly which comprises the steps of:

forming a bobbin having a spool portion and a plurality of recesses in its surface;

winding at least primary and secondary windings on said spool portion;

forming solderless terminal engagement means of a conductive material, each having a female clip portion and a tang portion extending from said clip portion;

securing the clip portion of different terminal engagement means within at least some of said recesses, said tang portions extending, in the same direction, away from said recesses and said bobbin surface;

establishing an electrical contact between said tang portions and said windings;

forming a terminal block;

mounting a plurality of terminals on said terminal block in a configuration which may be aligned with the clip portions secured within said recesses;

aligning said terminals and clip portions;

forcing said terminals into said clip portions from the direction of extension of said tang portions by a force imparted to at least one of said bobbin and terminal block, said clip portions frictionally engaging said terminal means and said terminal means extending from said clip portions in the direction of extension of said tang portions.

4,044,459

HIGH-GRADE METALLIC PRODUCTS

Richard D. Burlingame, Cleveland Heights, Ohio, assignor to Luria Brothers & Co., Inc., Cleveland, Ohio

Division of Ser. No. 412,119, Nov. 2, 1973, Pat. No. 3,883,997.
This application Jan. 29, 1975, Ser. No. 544,882
The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.
Int. Cl.[2] B08B *3/10*
U.S. Cl. 29—614 **3 Claims**

1. A product of manufacture comprising: a multiplicity of irregularly shaped masses of blast-furnace slag-iron having a random size distribution throughout the range of up to a thickness of about 6 inches and a lateral dimension of about three feet and each article having a relatively low amount of slag substantially uniformly distributed therethrough and having at or in contact with its surface a large number of irregularities, crevices and fissures, a quantity of a contaminating slag rigidly adhered to the iron, at least part of said slag being located within said crevices and fissures, said slag comprising less than about ten percent by weight of the total weight of the product, said product having been produced by

breaking blast furnace iron-slag into pieces having a substantial amount of such slag exposed at or to the surface of each piece;

continuously tumbling a mass of such pieces against each other in order to achieve a relatively uniform redistribution of such pieces within such mass; and while effecting such redistribution substantially continuously imparting such pieces with a shower of a substantial quantity of small particles having a hardness greater than the hardness of the slag impurities and at a high velocity and for a period of time sufficient to abrade such impurities from the iron.

4,044,460

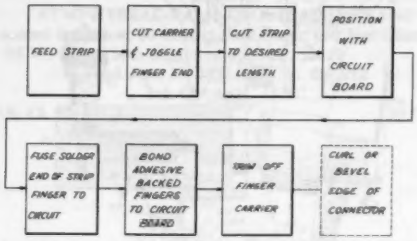
METHOD OF MOUNTING PREFABRICATED CONTACTS FOR PRINTED CIRCUIT CARD CONNECTORS

Herbert I. Schachter, 86 Campbell St., New Hyde Park, N.Y. 11040

Division of Ser. No. 625,090, Oct. 23, 1975. This application Sept. 20, 1976, Ser. No. 724,611
Int. Cl.[2] H01R *43/02*
U.S. Cl. 29—628 **15 Claims**

1. Method of mounting a prefabricated strip of conductive elements in the form of contacts on a printed circuit board to form an array of serially spaced contacts or terminals at the free ends of a plurality of circuit leads or conductors on the circuit board, the method comprising the steps of feeding a

prefabricated strip comprising at least one elongate carrier and a plurality of spaced contacts made out of electrically conductive material, each of said contacts being connected at one end to said carrier and having a free end at the other end thereof; aligning the free ends of said contacts with the free ends of the plurality of circuit leads or conductors and positioning said contacts proximate to the circuit board portions on which said


FEED STRIP
CUT CARRIER & JOGGLE FINGER END
CUT STRIP TO DESIRED LENGTH
POSITION WITH CIRCUIT BOARD
FUSE SOLDER END OF STRIP FINGER TO CIRCUIT
BOND ADHESIVE BACKED FINGERS TO CIRCUIT BOARD
TRIM OFF FINGER CARRIER
CURL OR BEVEL EDGE OF CONNECTOR

contacts are to be mounted; first electrically joining said contact free ends to said free ends of said plurality of associated circuit leads or conductors; secondly mechanically joining said contacts to the circuit board; and removing said carrier from said contacts to permit the resulting free ends of said contacs to mate with cooperating connector elements on a connector to be electrically connected to the printed circuit on said board.

4,044,461

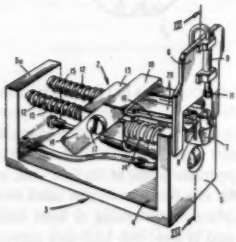
DEVICE FOR THE MECHANICAL INSERTION OF CURSORS ONTO OPEN SLIDE FASTENERS, ALREADY APPLIED ON GARMENTS

Angelo Lova, Vigevano (Pavia), Italy, assignor to Manifattura Magni Dante & C., S.p.A., Pavia, Italy

Filed Nov. 11, 1975, Ser. No. 631,169

Int. Cl.[2] A41H *37/06*; B21D *53/50*; B29D *5/00*

U.S. Cl. 29—768 **4 Claims**



1. Device for mechanical insertion of a cursor onto a slide fastener composed of two belts carrying teeth already applied to garments, comprising a carrying structure to be applied on a table consisting of front and rear parallel vertical plates, said front plate having an extension which carries an opening therein, a block cursor support applied on said front plate of said structure in correspondence with the opening of the extension to receive and support the cursor to be inserted, a first fluid pressure cylinder positioned on said extension, a pressing element controlled by said fluid pressure cylinder so that the driving of the cylinder determines the locking of the cursor in its support, a pair of parallel grippers having upper and lower jaws placed on both sides of the cursor support to grasp the ends of the two belts of the fastener to draw them backwards and to engage the two series of teeth in the cursor, longitudinal guides extending between said two vertical plates of the structure, a slide plate carried by said guides, the lower jaws of said grippers being carried by said slide plate and a second fluid pressure cylinder having a shaft positioned on said front plate to operate said grippers.

4,044,462

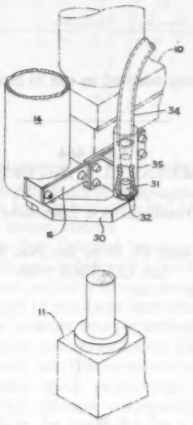
RIVET BLANK FEEDER FOR RIVETING APPARATUS

Dario Anselmo, Williamsville, N.Y., assignor to General-Electro Mechanical Corporation, Buffalo, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,389

Int. Cl.[2] B23Q *7/10*

U.S. Cl. 29—809 **7 Claims**



1. Apparatus for inserting rivet slugs in an annular holder associated with rivet head forming means, said apparatus comprising a fluid pressure power cylinder, a piston in said cylinder and a piston rod projecting therefrom, a rivet slug transfer arm fixed to said piston rod, said power cylinder being operable to raise and lower said transfer arm by axial movements of said piston rod, and means for swinging said transfer arm about the axis of said cylinder between positions in axial alignment with a rivet slug supply means and said rivet head forming means with said transfer arm in a lowered position, whereby said transfer arm receives a rivet slug at said supply means, is lowered by operation of said power cylinder, swings to alignment with said rivet head forming means and is raised by operation of said power cylinder to insert said slug in said holder.

4,044,463

SHAVING APPARATUS WITH A HOLDER FOR A CUTTING ELEMENT

Eduard Willem Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,799

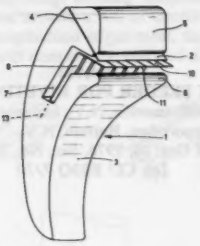
Claims priority, application Netherlands, June 12, 1975, 7506985

Int. Cl.[2] B26B *21/22*

U.S. Cl. 30—34.2 **3 Claims**

1. A shaving apparatus comprising a holder, a cutting element fixedly positioned in said holder, and a hair-pulling member mounted at one end in said holder in proximity to said cutting element, said hair-pulling member being resilient and having at its other end a blade shaped portion normally projecting further from the holder than the cutting member, said blade shaped portion being composed of a plurality of individ-

ual lamellar segments disposed in side-by-side relationship and independently movable relative to each other, and said blade



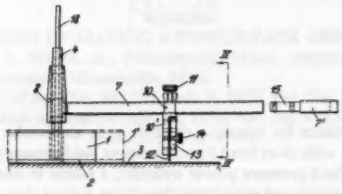
shaped portion being adapted in use to move into and out of said holder.

4,044,464

CIRCULAR CUTTING DEVICE

Georg Schiess, Predigergasse 7, Zurich, Switzerland (8001), and Jorg Heinzer, Vrenelisgartli 6, Einsiedeln (Kt.Schwyz), Switzerland (8840)

Filed July 27, 1976, Ser. No. 708,947
Int. Cl.² B26B *5/00*
U.S. Cl. 30—164.9 **6 Claims**



1. A circular cutting device with an arm rotatable about a central axis carrying the cutting tool, wherein the axis is defined by a hollow shaft held in a stand plate which provides the necessary stability for working by means of its own weight and an adhesive coating on its underside resting on the workpiece, the hollow shaft guiding a centering pin displaceably in the axial direction, with a spring tending to hold the centering pin in a position protruding from the stand plate at the bottom.

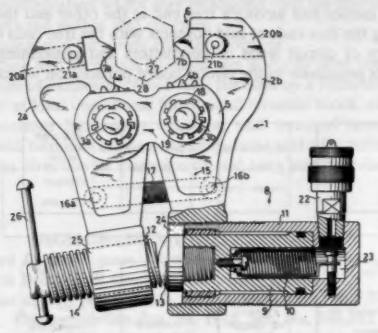
4,044,465

CUTTING APPARATUS FOR A RUSTY NUT

Hashimoto Shuji, No. 224-1 Notame-Oaza,, Minami, Fukuoka, Japan

Filed July 9, 1976, Ser. No. 704,053
Claims priority, application Japan, Feb. 17, 1976, 51-16712[U]
Int. Cl.² B26B *17/00*
U.S. Cl. 30—180 **2 Claims**

1. Apparatus for cutting a rusty nut comprising two arms, two blades, a respective one of the blades being mounted near one end of each of the arms in opposition to the other blade on the other arm, a hydraulic cylinder and piston assembly mounted at the other end of one of the arms, the cylinder being connected to said other end of said one arm, adjustable means connected to the other end of the other arm and providing a surface for being contacted by the free end of the piston, the hydraulic assembly being so oriented that actuation of the piston extends the piston toward the other arm and into contact with the adjustable means, the adjustable means including means for adjusting said surface toward or away from the free end of the piston, a respective axis connected to each of the arms at a point between the ends thereof, each of the arms being pivotable about its respective axis, a plate connected to both axes and thereby linking the arms together, a respective gear rotatably mounted on each of the axes, the gears being in mutual engagement so that the arms move simul-



taneously inwardly or outwardly and spring means for urging the arms away from each other.

4,044,466

DEVICE ESPECIALLY FOR ENDOOSSEOUS IMPLANTATION

Ugo Pasqualini, Via Borgonuovo, 26, Milan, and Giovanni Russo, Via del Minatore, Verona, both of Italy

Filed May 19, 1975, Ser. No. 578,566
Claims priority, application Italy, May 30, 1974, 23360/74
Int. Cl.² A61C *13/00*
U.S. Cl. 32—10 A **1 Claim**

1. A device for endoosseous implantation, comprising a plate member insertable into a surgical fissure provided into the cancellous tissue of the jaw bone, below the cortical tissue of the jaw bone, said plate member having on its oral cavity facing edge an appendix with, at its free end, a threaded portion emerging into the oral cavity, at least one through hole provided in said plate member and at least one stabilising bar engaging within said at least one hole and extending transverse to said plate member, said stabilizing bar being insertable into a respective surgical transcortical channel and having its ends supported by the vestibular cortical tissue and the lingual cortical tissue of the jaw bone respectively and positioning means removably connectable to said plate member for the preparation of said trascortical channel in alignment with said hole and for inserting said stabilising bar therein and in said hole, wherein said positioning means comprise a bridge element having an arm including connecting means for removable rigid connection with said plate member, said bridge element further comprising, on the side opposite said arm, at least one guide cylinder comprising an inner through cavity the axis of which is in alignment with the axis of said at least one hole when said positioning means is fixed on said plate member, said removable connecting means comprising a bush in said arm and engaging with said appendix and a threaded plug for removable engagement with the threaded portion of said appendix and wherein said removable connection means further comprise a pair of wedge projections on that edge of said plate

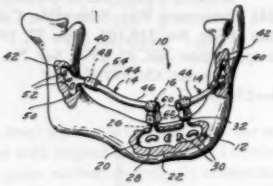
element from which said appendix extends, and a pair of conjugate cavities provided in said arm.

4,044,467

SYMPHYSEAL-RAMI EDOSTEAL IMPLANT

Leonard I. Linkow, 30 Central Park South, and Joni Chambliss, 58 W. 58 St., both of New York, N.Y. 10019

Filed June 28, 1976, Ser. No. 688,012
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—10 A 30 Claims



17. A symphyseal-rami endosteal implant adapted for use with at least one anterior abutment comprising

A. at least one ramus blade having a first portion adapted to be received in a ramus bone and a second portion defining a rod adapted to extend generally parallel to the occlusal plane when said ramus blade first portion is received in the ramus bone; and

B. at least one means for connecting said ramus blade to an associated anterior abutment, said connecting means having generally vertically aligned first and second portions, said first portion being adapted to engage, slide longitudinally with respect to, and be secured to a length of said rod and said second portion being adapted to engage and be secured to, the associated anterior abutment.

4,044,468

HANDLE FOR CUTTING AND ABRADING INSTRUMENTS USEFUL IN THE PRACTICE OF ENDODONTIA

Henry Kahn, 366 Dell, Highland Park, Ill. 60035

Filed May 3, 1976, Ser. No. 682,361
Int. Cl.[2] A61C *5/02*
U.S. Cl. 32—57 2 Claims

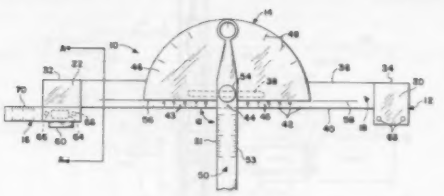
1. A file useful in root canal therapy comprising a toothed working end and a shank end, said shank end having a hangle attached thereto to be held between the thumb and index finger, said handle having two pairs of opposite faces, each of said faces being doubly concave inwardly and said faces being further characterized by different surface discontinuities for tactile differentiation therebetween.

4,044,469

MULTI-FUNCTION MEASURING INSTRUMENT

Donald L. Posey, 1418 N. King St., Hampton, Va. 23669

Continuation of Ser. No. 606,892, Aug. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 475,339, May 31, 1974, abandoned. This application Sept. 24, 1976, Ser. No. 726,715
Int. Cl.[2] B43L *7/06*
U.S. Cl. 33—102 6 Claims



1. A geometrical instrument for simultaneously measuring linear distance and angles comprising:

an elongated bar having two ends and an indicia means for making linear measurements;

a first mounting plate fastened to one of said ends and a second mounting plate fastened to said other end;

an adjustable tape measure having means for detachment and reattachment of said same tape measure to said instrument; said tape measure being selectively detachable from one of said first or second mounting plates and reattachable to the other of said first or second plates, said first and second mounting plates positioning said tape measure thereon; said tape measure cooperating with said indicia means to indicate the distance from a distant point from either end of said bar to any indicia point along said elongated bar;

an adjustable angle measuring device slidably mounted on said elongated bar for enabling measurements to be made of an angle and of the distance from the vertex of that angle to a distant point, concurrently and in combination; wherein said elongated bar has a slot therein in which said angle measuring device is slidably mounted and a measurement edge means on said elongated bar said measurement edge means for alining said instrument with a workpiece and being positionable on a first surface of the workpiece and said first and second mounting plates being oriented with respect to said elongated bar such as to extend below said measurement edge means to provide an angled recess for engagement of an angled corner of a workpiece.

4,044,470

COLLAR LOCATING APPARATUS

Alex Dufrene, P.O. Box 194, Des Allemands, La. 70030

Filed Jan. 15, 1976, Ser. No. 649,440
Int. Cl.[2] E21B *47/04;* G01B *5/18*
U.S. Cl. 33—125 R 7 Claims

1. Collar locating apparatus adapted to be run in a tubing string to locate collars therein which apparatus comprises:

a. and elongate body;

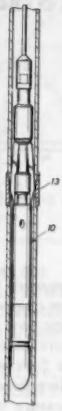
b. a pair of opposing, resiliently urged arms;

c. spaced first and second shoulders facing one another on said body and defining a portion therebetween of reduced relative diameter;

d. a ring segment appended to each arm and positioned between said first and second shoulders, said ring segments mounting said arms for pivotal movement from a first to a second position where the first position is closer to said elongate body and the other position is outwardly deflected from the first position;

e. resilient means bearing against said arms to urge said arms to said deflected position;

f. clamp means carried on said elongate body and slidably movable axially of said body to clamp said arms, said clamp means further being constructed and arranged to adjustably vary the clamping achieved on said arms wherein said arms deflect by differing amounts on moving to the deflected position dependent on the position of said



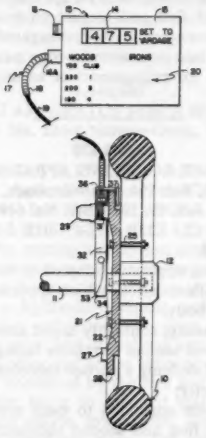
clamping means and lock means for locking said arms in the retracted position during downward movement of the tool in the tubing string by holding said clamp means in its upward most position so that said arms are in said first position and wherein said lock means is releasable to enable said arms to deflect outwardly from said body.

4,044,471

YARDAGE COUNTER ATTACHMENT FOR GOLF CARTS AND THE LIKE

Oscar Fredrick Allan Peterson, 3125 Portage Ave., Winnipeg, Manitoba, Canada

Filed Apr. 16, 1976, Ser. No. 677,698
Int. Cl.[2] G01C *22/00*
U.S. Cl. 33—141 R **5 Claims**



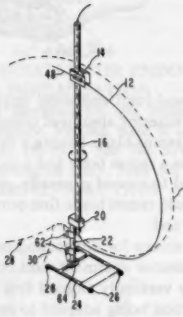
1. In a yardage measurement device for use on golf carts and the like which include a pair of ground engaging wheels, and axles bearingly mounting said wheels for rotation, said device including a settable distance counter mounted on the golf cart; the improvement which comprises in combination a drive component securable to one of said ground engaging wheels, a rim on said component, gear tooth means on said component adjacent said rim, a converter assembly, means to support said assembly adjacent said component whereby said gear tooth means operatively engages said converter assembly, and flexible cable drive means operatively extending from said converter assembly to said distance counter, said means to support said assembly adjacent said component including a bracket detachably clampable to one of said axles, said converter assembly being secured to the distal end of said bracket, and a retainer clip secured to said converter assembly and freely engaging over and around the rim of said component.

4,044,472

SHRUB TRIMMING GUIDE

John Jue, 141 Connemara Way, Sunnyvale, Calif. 94087

Continuation of Ser. No. 510,104, Sept. 27, 1974, abandoned.
This application Jan. 12, 1976, Ser. No. 648,222
Int. Cl.[2] G01B *3/14*
U.S. Cl. 33—174 G **13 Claims**



1. Apparatus for use in trimming a plant having growth defining an outer peripheral margin therefor comprising: a rod having means adjacent to one end thereof for positioning the same adjacent to the central part of a plant to be trimmed with the rod extending from a first location near the lower part of the growth to a second location near the upper part of the growth; an elongated, resilient member of one-piece construction adapted to extend along and adjacent to the outer peripheral margin of the plant to provide a guide for a cutter to shorten the growth at said outer peripheral margin, said rod including means for housing at least a part of said member and for allowing the member to pay out from a first end of the rod, to return to said housing means, and to extend along and adjacent to said outer peripheral margin from a position near the first end of the rod to a position near the second end of the rod; and second means adjacent to the second end of said rod for adjustably securing the member thereto.

4,044,473

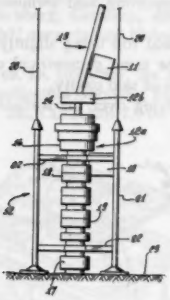
TILT DETECTOR AND SYSTEM

Geoffrey J. Crask, Santa Ana, Calif., assignor to Hydril Company, Los Angeles, Calif.

Division of Ser. No. 445,639, Feb. 25, 1974, Pat. No. 3,911,592.
This application May 2, 1975, Ser. No. 574,033
Int. Cl.[2] G01C *9/06, 9/22*
U.S. Cl. 33—333 **16 Claims**

1. A system including the combination comprising a sub-surface stack of wellhead equipment on the ocean-floor and a riser pipe projecting upwardly from said stack, the riser pipe proximate the stack tilted from vertical, and relative to the stack, and a tilt accommodating universal joint connecting the riser pipe and stack including means maintaining the stack and riser in aligned azimuthal relation, a pair of tilt detectors, one car-

ried by said sub-surface stack of equipment on the ocean floor and the other carried by said riser pipe projecting upwardly from said stack, said other detector spaced above said stack, each detector defining a plane and including a level sensor, the



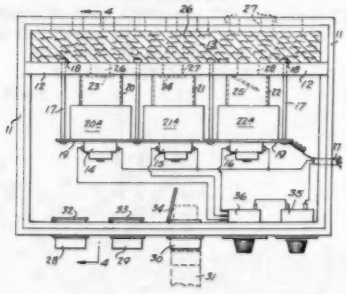
output of each level sensor corresponding to the magnitude of tilt of said plane with respect to vertical, and control means on a vessel at the ocean surface operatively connected with each detector for providing a visual display corresponding to the magnitude of tilt and said riser with respect to said stack.

4,044,474

ANIMAL DRYER

Edwin R. Greene, and Rodney F. Greene, both of 1634 Michael Drive, Pinole, Calif., 94564

Filed Aug. 6, 1976, Ser. No. 712,057
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—86 **7 Claims**



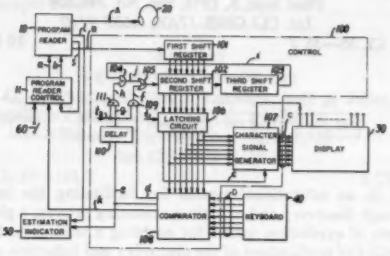
1. A hair dryer comprising a filter system, means for admitting surrounding air to the filter system, a partition having a plurality of openings for directing the air to leave the filter system, a plurality of valves in said openings for selectively permitting the air to leave said openings, a plurality of motors each having an air inlet connected to one of said openings, fans driven by the motors to blow the air past the motors and to thereby warm the air from the heat of the motors, means for collecting the warm air from the motors, and means for attachment to the collecting means for conducting warm air to a user.

4,044,475

TRAINING MACHINE FOR KEYBOARDS

Kenzo Fujisawa; Yoshiyasu Sakaedani, and Akio Tsuji, all of Kamakura, Japan, assignors to Mitsubishi Precision Company, Ltd., Japan

Filed June 25, 1975, Ser. No. 590,115
Claims priority, application Japan, July 2, 1974, 49-74976
Int. Cl.[2] G09B *13/00*
U.S. Cl. 35—6 **4 Claims**



1. A portable training machine for training keyboard operation comprising, in combination, program reader means for reading out a character coded signal including a plurality of binary coded signal blocks which form a word, display means for displaying characters represented by said plurality of binary coded signal blocks which form said word, keyboard means including a plurality of keys bearing different characters thereon, said keyboard means delivering binary coded signal blocks representing those characters borne on said keys when a student strikes the keys in accordance with said word displayed on said display means, said binary coded signal block from said keyboard means being identical to that from said program reader means for the same character, and control means connected to both said program reader means and said keyboard means to successively compare said binary coded signal blocks from said keyboard means with corresponding binary coded signal blocks from said program reader means to thereby successively erase said characters of said word displayed on said display means when the keys are correctly struck and cause said word to be again displayed on said display means when a key is erroneously struck during the striking of the keys corresponding to the words, said control means further including means for adding to each of said binary coded signal blocks of said character coded signal an additional bit for determining whether a character represented by the binary coded signal block with said additional bit is display on said display means, wherein said control means includes a closed loop memory including a pair of shift registers serially connected, said binary coded signals blocks of said character coded signal being stored in said closed loop memory while recirculating at a high speed therethrough, means for adding an additional bit to each of said binary coded signal blocks entered into one of said shift registers, said display means being responsive to said additional bit for permitting an associated signal block to be displayed as a character on said display means, a latching circuit connected to the one shift register to latch each of said binary coded signal blocks each time it is transferred thereto, a comparison circuit connected to both said keyboard means and said latching circuit to successively compare said binary coded signal blocks from said keyboard means with corresponding binary coded signal blocks from said latching circuit to produce a coincidence signal when each pair of said compared signal blocks are identical to each other and to produce a non-coincidence signal when said pair of compared signal blocks are different from each other, circuit means responsive to said coincidence signal to change said additional bit coupled to that signal block compared with the correct signal block from said keyboard means to erase that character represented by the signal block coupled thereto, and

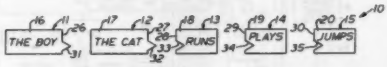
display on said display means, and another circuit means responsive to said non-coincidence signal to return the changed additional bit back to its original bit thereby to again display all the original characters on said display means.

4,044,476

EDUCATIONAL METHODS AND DEVICES

Jeanette B. Marsh, 1400 N. Lake Shore Drive, Chicago, Ill. 60610

Filed Sept. 5, 1973, Ser. No. 394,509
Int. Cl.[2] G09B *17/00*; A63F *9/10*
U.S. Cl. 35—35 J **10 Claims**



1. In an educational system for facilitating the learning through discovery and inductive reasoning provess a plurality of sets of expression means for enabling a student to learn a plurality of applications of the discovery and inductive reasoning process as applied to the learning of a plurality of sets of interrelated concepts, the respective subject matters of said plurality of sets of interrelated concepts being substantially different and being such that a student learns that the discovery and inductive reasoning process is applicable to a variety of fields of interest from learning of its application to said plurality of subject matters, said expression means of each of said sets having a multiplicity of expressions thereof divided into first and second groups and being physically manipulatable to dispose any expression of said first group into adjacent relation to any expression of said second group, each expression of said first group being combinable with a plurality of expressions of said second group to form a plurality of different correct examples of similar expressions and to establish for the corresponding set of interrelated concepts a plurality of different correct examples of combinations of expressions and a plurality of incorrect examples of combinations of expressions,, interengagement means on said expression means of each of said sets having physical configurations and interchangability such that a physically non-mating relationship exists when each incorrect example is established and such that a physically mating relationship exists when each correct example is established so as to reward the student and so as to increase his confidence as each new correct example is established, said multiplicity of expressions on said expression means of each of said sets and the numbers of said correct and incorrect examples being sufficient to enable the student to learn said interrelated concepts solely from the discovery and inductive reasoning process during trial and error manipulation of said expression means and to facilitate learning through the discovery and inductive reasoning process itself irrespective of the subject matter of said one set of interrelated concepts, each of said sets of expression means being such as to provide at least on the order of 100 different possible complete and correct examples and being such that at least eight simultaneously visible different correct examples can be formed, said expression means including mating projection and recess means so constructed and arranged that both the existence and non-existence of said physical mating relation is readily determined tactilely without visual observation.

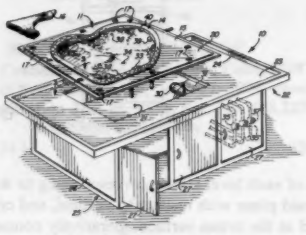
4,044,477

POOL MODELS

Robert J. Kane, 5035 N. 12th St., Phoenix, Ariz. 85011

Filed Oct. 26, 1976, Ser. No. 735,375
Int. Cl.[2] G09B *25/00*
U.S. Cl. 35—49 **8 Claims**

1. A model of a swimming pool installation comprising:
a swimming pool defining a cavity having bottom and side walls and a first flange having a first part extending around the edge of said cavity and substantially perpendicular thereto simulating a pool decking and a second part extending laterally from said first part around its free edge but coplanar therewith at a different level,
the said free edge of said second part defining a given configuration,
a cabinet for supporting said swimming pool having an apertured top,
the aperture of said top being slightly larger than and of substantially the same geometrical configuration as the peripheral edge of said cavity,
said first flange lying over the surface of said top of said



cabinet for supporting the swimming pool positioned to extend into the aperture,
said top having a second flange around its edge for receiving within its periphery the outer edge of said given configuration of said second part of said first flange, and
a plurality of indentations formed in and around the periphery of said given configuration for receiving fastening means for securing said swimming pool to the top of said cabinet,
whereby the fastening means when inserted in indentations lie below the top surface of said second part of said first flange.

4,044,478

QUICK RELEASE FOR WADERS

Gerald H. Girard, Springside-Morrison Ave., Troy, N.Y. 12180

Filed Mar. 9, 1976, Ser. No. 665,221
Int. Cl.[2] A43B *3/00*; A44B *9/00*
U.S. Cl. 36—1.5 **3 Claims**

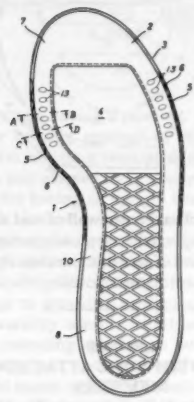
1. A quick release for waders, comprising:
a pair of waders,
a strap attached to the waders,
means of movably attaching a pin to the strap,
a male ferrule forming a shaftway through the ferrule and attached to an end of the strap, and
a female ferrule forming a pair of shaftways through the female ferrule and attached to an upper edge of the waders, whereby the male ferrule may be received in the female ferrule and the pin may be passed through the shaftways of the female and the male ferrules thereby

releaseably connecting the waders strap to the waders and thereby securing the waders to a fisherman.

4,044,479
SHELL SOLE

Eugen Brutting, Nurnberg, Germany, assignor to EB Sport International GmbH vormals and Heiner Stuhfauth GmbH, Germany

Filed Feb. 13, 1976, Ser. No. 658,130
Claims priority, application Germany, Feb. 15, 1975, 2506530
Int. Cl.[2] A43B *13/04*
U.S. Cl. 36—32 R 27 Claims

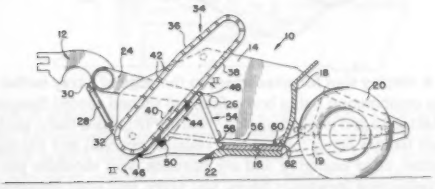


1. A unitary shell sole for footwear comprising a sole bottom portion providing a base for a tread sole portion, an upwardly rising edge portion extending around the periphery of the sole bottom at the outer edge thereof, and a plurality of longitudinally distributed predetermined bending points along said edge portion, said plurality of bending points being constituted by a plurality of spaced relatively thin-walled portions in said edge portion.

4,044,480
ELEVATING SCRAPER WITH PERFORATE SEPARATOR

Robert Norris Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 27, 1976, Ser. No. 690,347
Int. Cl.[2] E02F *1/00*; B07B *1/00*
U.S. Cl. 37—8 5 Claims

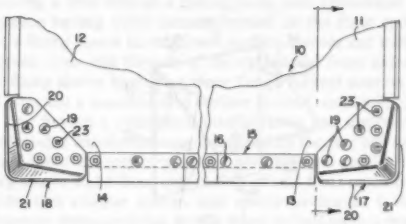


1. In an elevating scraper adapted to be towed by a tractor to perform earth-grading operations and the like including a vehicle frame, means on the frame whereby the frame may be towed over the underlying terrain, a forwardly open scraper bowl on said frame and terminating in a lower, forwardly extending scraper edge, an upwardly and rearwarding extending elevating conveyor assembly mounted on said frame forwardly of said scraper bowl and spaced from said scraper edge, and a support surface closely adjacent to and extending upwardly from the lower end of said conveyor assembly and cooperating therewith whereby material may be elevated by said conveyor assembly and supported during such elevation by said support surface to be moved into said scraper bowl, the improvement wherein said support surface comprises a first grid assembly; means securing said first grid assembly to said frame; a second grid assembly extending downwardly and rearwardly from said first grid assembly toward said scraper edge and means mounting said second grid assembly on said frame for movement between positions opening and closing said scraper bowl.

4,044,481
REVERSIBLE BLADE BIT

Larry G. Eftefield, and Paul J. Lukavich, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 11, 1976, Ser. No. 665,731
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 T 6 Claims

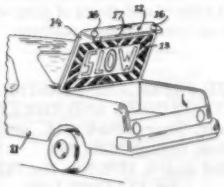


1. a reversible end bit for selective mounting to an earth-working blade having opposite corner portions, said bit comprising a one-piece rigid member having a first cutting edge portion, a second cutting edge portion extending transversely to said first cutting edge portion, and a mounting portion included between said cutting edge portions and adapted to be mounted to one corner portion of a blade with said mounting portion facially abutting the blade and said first cutting edge portion in forwardly projecting cutting position, and to the opposite corner portion of the blade with said mounting portion turned approximately 90° and facially abutting the blade and the second cutting edge portion in forwardly projecting cutting position, said member being substantially symmetrical about a centerline bisecting the angle defined by said cutting edge portions and said mounting portion.

4,044,482
WARNING DEVICE

Alfred Mosch, 9705 NW. 70 St., Tamarac, Fla. 33321

Filed Mar. 25, 1976, Ser. No. 670,351
Int. Cl.[2] B60Q *7/02*
U.S. Cl. 40—129 C 8 Claims



1. An optical warning device, for use in connection with the lid of a compartment of a vehicle, said lid having an inner surface disposed in the compartment when the lid is closed and, respectively, being visible from outside said vehicle when said lid is open;

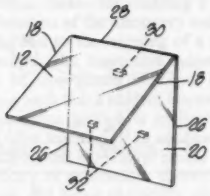
comprising, in combination:
an optical warning sign mounted on said inner surface of said lid; and
illuminating means spaced apart from said sign and being mounted on and through said lid and operable to illuminate said sign when the lid is open and including a light source spaced apart from said sign and being operable to direct light towards said sign to be reflected by said sign; said illuminating means additionally comprising both means for directing light in an upward direction away from said lid, and means for directing light in an outward direction away from said lid in a substantially horizontal direction.

4,044,483

DISPLAY DEVICE AND METHOD OF MAKING SAME

Cole C. Williams, 2408 Allanjay Place, Glendale, Calif. 91208

Filed Dec. 3, 1975, Ser. No. 637,297
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152 **4 Claims**



1. A frame for displaying photographs and the like comprising:
a. a first sheet of glass having opposing front and back parallel faces and at least one substantially straight side disposed within a plane generally perpendicular to the plane of said faces;
b. a second sheet of glass having opposing front and back parallel faces and at least one substantially straight side disposed within a plane generally perpendicular to the plane of said faces; and
c. hinge means for hingeably interconnecting said first and second sheets of glass along said straight sides thereof so that said first and second sheets are movable from a closed position wherein said back face of said first sheet of glass is in engagement with said front face of said second sheet of glass into an open position wherein said first and second sheets of glass are in a substantially coplanar relationship, said hinge means comprising a room temperature vulcanizing silicone rubber bonding material bonded to said straight sides of said first and second sheets of glass to hingeably interconnect said sheets of glass, said bonding material being in the form of a yieldably deformable bead which is generally semicircular in cross-section when said sheets are in a closed position and is resiliently deformable into a configuration wherein said bead is disposed intermediate said straight sides of said sheets of glass when said sheets of glass are in an open coplanar position.

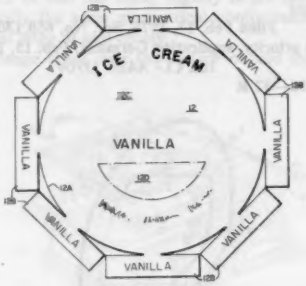
4,044,484

LONG-SKIRTED PAPER AND PLASTIC LID FOR FOOD CONTAINERS AND THE LIKE

Rodney E. Ludder, Severna Park, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Aug. 6, 1976, Ser. No. 712,355
Int. Cl.² G09F *3/00*
U.S. Cl. 40—306 **10 Claims**

1. A two-piece lid for containers comprising:
a plastic shell having a first central web portion and an annular skirt dependent from the periphery of said web portion, said annular skirt having inner and outer wall portions defining an annular trough therebetween and said outer wall having an upper portion extending above said web portion; and
an indicia bearing disc member having a second central web portion in substantially coextensive juxtaposition with said first central web portion and peripheral tab means thereon extending downwardly into said annular trough;



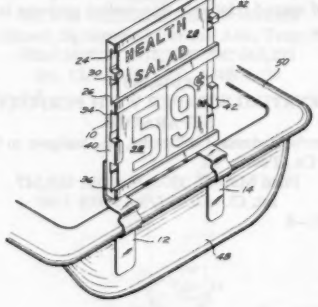
said upper portion of said outer wall of said skirt comprising an inwardly facing annular top curl juxtaposed with said second web portion of said disc member about the periphery of said first central web portion.

4,044,485

DISPLAY SIGN WITH EDGE ATTACHING FLANGE MEMBERS

Philip Hopp, New York, N.Y., assignor to The Hopp Press, Inc., New York, N.Y.

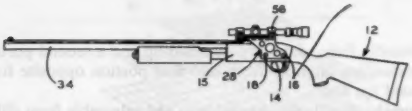
Filed Mar. 1, 1976, Ser. No. 662,460
Int. Cl.² G09F *3/00*
U.S. Cl. 40—324 **1 Claim**



1. A display sign for attachment to the edge of a tray including in combination a sign body, first and second spaced flanges connected to and depending downwardly from said body, each of said flanges being formed of a resilient material and having shoulder, edge engaging and leg portions, said shoulder portion projecting forwardly below said body, said edge engaging portion projecting downwardly from said shoulder portion, said leg portion projecting downwardly from said edge engaging portion and rearwardly thereof, said edge engaging portion being arcuately formed to engage a rolled edge of said tray and resiliently urge said leg portion against the side thereof, a knuckle formed in said edge engaging portion projecting rearwardly to abut against the edge of said tray to distort said respective flange which due to its resiliency seeks to return to its original configuration, and a further flange depending from said sign body rearwardly of said first and second flanges

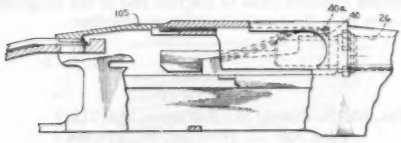
whereby said tray edge can be sandwiched between said further flange and said first and second flanges.

4,044,486
GUN SIGHT MOUNTING
James Wilbur Van Holten, Rte. 5, Columbia City, Ind. 46725
Filed Feb. 23, 1976, Ser. No. 659,992
Int. Cl.² F41G *1/38*
U.S. Cl. 42—1 ST **5 Claims**



1. A shoulder gun having a receiver, two spaced mounting bolts, a trigger housing retained by said mounting bolts, a mounting bracket including two openings, one for each of said mounting bolts and adapted to be clamped to the gun by said bolts, said bracket having an upright flange portion extending alongside of the receiver, a transverse flange disposed slightly above the receiver and in parallel relationship with the receiver of said gun, means forming a track on said transverse flange and extending for virtually the entire length of said transverse flange to provide a continuously extending mounting means of variably useable length and including parallel longitudinally extending continuous wedge sections, screw means for fastening said track on to said transverse flange, and replaceable sight means including mounting means mounted on said track and movable to a preferred position along the length of said track over the length of said transverse flange covered by said track, said mounting means including a screw-clamping means for effecting a rigid mounting connection between said track and said sight means.

4,044,487
ROTARY PORT COVER
James C. Hutton, Mohawk; Thomas G. Bauman, Ilion, and Kenneth C. Rowlands, Utica, all of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.
Filed May 27, 1976, Ser. No. 690,518
Int. Cl.² F41C *27/08*
U.S. Cl. 42—16 **31 Claims**

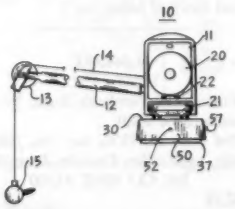


9. A firearm having a hollow receiver in which a bolt assembly reciprocates from a rear, breech open position to a forward, breech closed position, an ejection port in said receiver, a port cover mounted in said receiver, means restraining longitudinal movement of said port cover relative to said receiver while permitting rotational movement into and out of ejection port covering position, cam pin means on said bolt assembly, corresponding cam track means on said port cover, said pin means and said cam track means cooperating to cause rotational movement of said port cover during a portion of the total reciprocating stroke of said bolt assembly, said port cover being shorter in length than the length of stroke of said cam pin means so as to permit a compact port cover which is slightly longer than said ejection port.

4,044,488
ROD CHUCKING HANDLE FOR A FISHING ROD
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan
Filed June 24, 1974, Ser. No. 482,413
Claims priority, application Japan, June 27, 1973, 48-76976; Mar. 13, 1974, 49-28940
Int. Cl.² A01K *87/02*
U.S. Cl. 43—23 **1 Claim**

1. A rod chucking handle for a fishing rod which comprises in combination, a handle portion having a cylindrical front extension, said extension having an axial hole disposed for receiving a butt end of a fishing pole, said cylindrical front extension having outer threads formed on the front end portion, a fixing sleeve having inner surface threads and matingly disposed over said threads of the cylindrical front extension, said fixing sleeve having an inner flange formed near its front end adjacent a non-threaded surface thereof, an elastic clamping ring having a cylindrical configuration and disposed in a nonthreaded annular recess gap defined by the rear end surface of said inner flange, the adjacent non-threaded surface of the fixing sleeve and a front end surface of said front extension, an anti-friction annular spacer, said spacer having an L-shaped transverse cross-sectional profile taken in half-section from an axial line and having one leg member thereof disposed between the inner flange of the fixing sleeve and the elastic clamping ring, and the other leg member thereof being disposed between the non-threaded surface of the fixing sleeve and the elastic clamping ring, said anti-friction annular spacer being supported in the recess gap by the elastic clamping ring, said axial hole having a terminal rear inner wall converging and disposed to receive the butt end of a fishing pole along the converging inner wall, said threads on the cylindrical front extension and the fixing sleeve being mated such that fastening of the fixing sleeve onto the cylindrical front extension causes narrowing of the annular recess gap and thereby said clamping ring is forced to deform inwardly to provide a reduced inner diameter snugly engaging said butt end and transmitting an axial force thereto, and whereby the butt end of a fishing pole may be secured to the chucking handle by forceful engagement with the converging wall at one end and by the elastic clamping ring along a body portion of the butt end thereof.

4,044,489
TROLLING APPARATUS
Walter J. Henze, and San Thein, both of Philadelphia, Pa., assignors to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.
Filed Apr. 26, 1976, Ser. No. 680,118
Int. Cl.² A01K *97/10*
U.S. Cl. 43—27.4 **8 Claims**



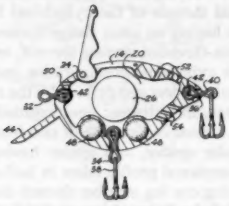
1. Trolling apparatus for fishing which comprises

a frame,
a reel mounted on said frame,
a boom secured to said frame with a pulley attached thereto for carrying line from said reel,
a swivel base,
means for detachably connecting said frame to said swivel base,
said swivel base including a fixed bottom plate, and
a rotatable top swivel plate detachably secured together and to which said frame is detachably connected, and
said swivel plate and said bottom plate having interengaging portions limiting free horizontal pivotal movement of said frame through a predetermined arc relative to the bottom plate.

4,044,490
FISHING LURE

Walter M. Young, 27 Anderson St., Piedmont, S.C. 29673, and Robert S. Young, Rte. 1, Pelzer, S.C. 29669

Filed Mar. 25, 1976, Ser. No. 670,105
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.06 **1 Claim**



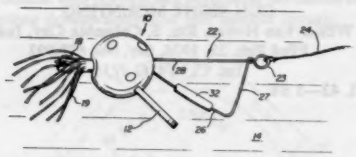
1. An artificial fishing lure provided for receiving a tablet which generates a gas when contacted by water so that as the lure is pulled through the water bubbles are generated for attracting the attention of fish, said lure comprising:
a rigid unitary body construction, said rigid body having a rounded front portion and a rearwardly and inwardly tapered rear portion, said body being formed by a pair of molded shells secured together by adhesive, said shells being substantially concave so as to define a cavity therebetween when secured together,
a pivotal door carried in a top portion of said body for providing access to said cavity so that said tablet can be deposited therein,
cooperating latch means carried by said pivotal door and said body holding said door closed,
weights carried in said cavity for causing said lure to sink in water,
a hole provided in a front portion of said rigid body through which water flows to said cavity for contacting said table when said plug is being fished, (and) a treble hook attached to the extreme rear portion of said body,
a row of holes provided in said housing above said treble hook, and a row of holes provided in said housing below said treble hook so that gas bubbles generated by said tablet encompass said treble hook as they are discharged through said rows of holes.

4,044,491
FISH LURE

John Thomas Potter, 152 Fernbank Road, Box 565, Stittsville, Ontario, Canada (K0A 3G0)

Filed June 29, 1976, Ser. No. 700,858
Claims priority, application Canada, June 18, 1976, 255280
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.22 **11 Claims**

1. A fish lure, comprising:
a buoyant body;
means for connecting said fish lure to a fishing line;
a hook suspended from said body;
a lip projecting from said body;
a projection extending from said body;
said projection comprising a first portion extending out-

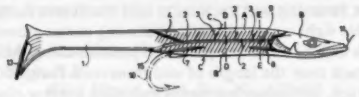


wardly from said body past said lip and a second portion extending laterally from said first portion opposite from said lip; and
a weight selectively attachable to and releasable from either of said first and second portions of said projection.

4,044,492
FISHING LURE

Alexander John Ingram, 40 Kiln Close, Mevagissey, Cornwall, England

Filed Feb. 20, 1976, Ser. No. 659,884
Claims priority, application United Kingdom, Feb. 28, 1975, 8516/75
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.28 **10 Claims**



1. A fishing lure comprising:
i. a simulated fish body having therein a generally horizontal slot extending longitudinally through the body towards the head of the fish and dividing the body into upper and lower body portions to allow the upper portion to flex horizontally relative to the lower portion, said lower body portion including a fishing hook receiving aperture
ii. a flexible tail portion moulded integrally with the upper body portion,
iii. a baffle plate positioned at the end of the tail and extending transversely of the body so that water action flexes the tail horizontally, and
iv. means disposed close to the rear end of the longitudinal slot to keep the two body portions together.

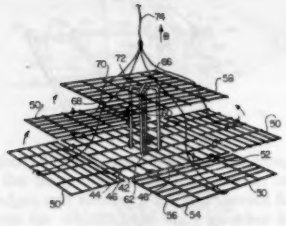
4,044,493
CRAB TRAP

Sam Fox, 630 N. Pulaski St., Baltimore, Md. 21217

Filed Apr. 22, 1976, Ser. No. 679,466
Int. Cl.[2] A01K *69/10*
U.S. Cl. 43—105 **8 Claims**

1. A meshed crab trap device having an open state when a crab can enter the device and a closed state for entrapping a crab in the device, said device comprising:
a. a meshed base member comprising a first plurality of wires positioned parallel to each other and a second plurality of wires positioned at an angle with respect to said first plurality of wires and affixed thereto;
b. a plurality of rectangular meshed side members having a width equal to approximately three-fifth of the length, each side member being pivotally coupled to one side of said base member wherein each side member comprises a first plurality of wires positioned parallel to each other and a second plurality of wires positioned at an angle with respect to said first plurality of wires and affixed thereto;

c. a meshed top member having a size and shape substantially identical to said bottom member, said top member comprising a first plurality of wires positioned parallel to each other and a second plurality of wires positioned at an angle with respect to said first plurality of wires and affixed thereto;



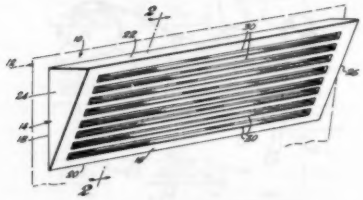
d. a plurality of U-shaped support means coupling said top member to said base member such that said top member is parallel to said base member, the distance between said top and bottom members being equal to the width of said side members, wherein when said crab trap is in its closed state said side members are perpendicular to said top and bottom members.

4,044,494

TRAP FOR FLYING INSECTS AND BUGS

Zbigniew Grajnert, P.O. Box BM, Marco Island, Fla. 33937

Filed Mar. 19, 1976, Ser. No. 668,692
Int. Cl.[2] A01M *1/24*
U.S. Cl. 43—119 **15 Claims**



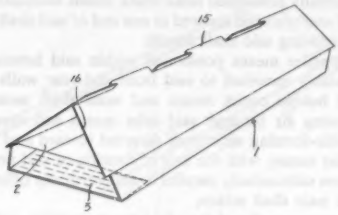
1. A trap for flying insects and bugs comprising:
a housing formed of a clear, transparent material, defining an interior chamber,
a slot means in said housing, opening into said interior chamber and defining confronting edges,
inwardly converging flange means along said confronting edges,
tape means fixed along said converging flange means, providing inwardly converging frayed warp strands along their lengths;
said trap including a highly reflective tape as of aluminum foil fixed along at least one surface of said flange means.

4,044,495

DEVICE FOR CAPTURING COCKROACHES

Akira Nishimura; Hiroshi Akamatsu; Sentaro Negoro, all of Ako, and Yasutoshi Yoshida, Kakogawa, all of Japan, assignors to Earth Chemical Company, Limited, Japan

Continuation-in-part of Ser. No. 566,798, April 10, 1975, abandoned, which is a division of Ser. No. 360,021, May 14, 1973, Pat. No. 3,913,259. This application Oct. 20, 1975, Ser. No. 624,190
Claims priority, application Japan, May 26, 1972, 47-62290; June 5, 1972, 47-66606; June 6, 1972, 47-67058; Nov. 21, 1972, 47-134736; Nov. 21, 1972, 47-117407
Int. Cl.[2] A01M *1/10, 1/14*
U.S. Cl. 43—121 **11 Claims**



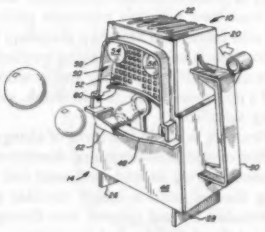
1. A device for capturing cockroaches comprising:
a rectangular base member,
two side means, extending from opposite side edges of said base member, said side means meeting along a line parallel to said opposite side edges of said base member to form a housing;
at least one stepping plate extending from said base along an end edge thereof, said stepping plate being inclined inwardly into said housing;
wherein an opening directly into said housing is formed at at least one end of said housing, said opening being defined by said stepping plate and said side means; and
wherein said stepping plate serves to prevent cockroaches from escaping from the interior of the housing after they have been captured.

4,044,496

BUBBLE BLOWER

Hans Jernstrom, 1 Villa Verdi, Apt. 111, Buffalo Grove, Ill. 60090

Filed Dec. 15, 1975, Ser. No. 640,826
Int. Cl.[2] A63H *33/28*
U.S. Cl. 46—7 **11 Claims**



1. A hand-operated bubble-blowing machine which includes:
a. a housing having:
i. a rear wall, a larger front wall spaced therefrom, outwardly flaring side, top and bottom walls which interconnect the rear and front walls and form a forwardly

tapering nozzle-like structure which enhances air flow through said housing;

ii. air inlet means in said rear wall;

iii. air inlet means in each of said top and bottom walls;

iv. bubble outlet means generally centrally positioned in said front wall;

v. means defining a reservoir for bubble-forming liquid positioned within said housing below said bubble outlet means and cooperatively associated with said front wall;

b. a bubble-forming mechanism cooperatively associated with said housing which includes:

i. main shaft means rotatably mounted within said housing and journalled to said front wall and said rear wall at positions below the bubble outlet means;

ii. externally positioned hand crank means associated with said rear wall and secured to one end of said shaft means for rotating said shaft means;

iii. propeller means positioned within said housing and rotatably mounted to said front and rear walls above said bubble outlet means and main shaft means, for drawing air through said inlet means and creating a bubble-forming air stream directed toward said bubble outlet means, with the axis of rotation of said propeller means substantially parallel to and vertically offset from said main shaft means;

iv. gear means for drivingly interconnecting said main shaft means and said propeller means and for rotating said propeller means at a rate substantially greater than the rotation of said main shaft; and

v. dipper means, mounted on said shaft means for rotation therewith, which includes a hub, a plurality of arms extending radially from said hub and a plurality of bubble-forming rings, one mounted to the distal end of each of said arms, said diper means being positioned within said housing and for rotation through said reservoir means for forming a film of bubble-forming liquid in said rings, and for positioning said film in said air stream and in alignment with said bubble outlet means.

4,044,497

KIT WITH MALE AND FEMALE ELEMENTS HAVING DEFORMABLE GRIPPING MEANS

Jean-Paul Bettens, Morges, Switzerland, assignor to Modulo S.A., Le Sentier, Switzerland

Filed Nov. 24, 1975, Ser. No. 634,863

Claims priority, application Switzerland, Dec. 4, 1974, 16073/70

Int. Cl.² A63H *33/10*

U.S. Cl. 46—17 **8 Claims**

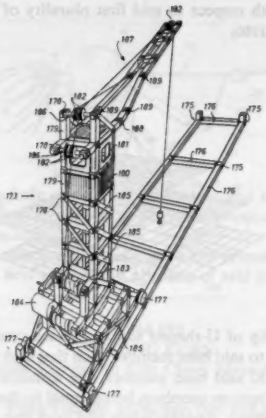
1. A construction kit comprising a plurality of male and female assembly elements,

said male elements being in the form of cubic bodies having square faces of predetermined dimensions, each said body having at least two securing members protruding from respective said faces, said securing members being in the form of tenons, each said tenon having a cylindrical shank, each said tenon having a guiding and positioning part in the form of a polygonal head on said shank, said polygonal head having side faces,

said female elements being in the form of elongate pieces of square section of said predetermined dimensions, each said female element having an end wall, said end wall having an opening therein with a major circular arcuate part which is bounded by and entered into through a narrow passageway defined and formed by gripping means comprising two elastically deformable facing projections defined in said end wall,

each said tenon shank being shaped and dimensioned such that said tenon shank can be forced through said narrow passageway and past said projections and said tenon shank deforms said projections as its passes and such that said tenon shank can be introduced into and retained in said major circular arcuate part of said opening in said end wall of said female element,

each said female element having inner walls defining a hol-



low space for receiving a said tenon polygonal head, said polygonal head being shaped and sized such that said faces of said polygonal head engage and are guided and positioned by said inner walls of a said female element.

4,044,498

TOY ANIMAL FIGURES WITH INTERCHANGEABLE SADDLE AND CENTER BODY PART

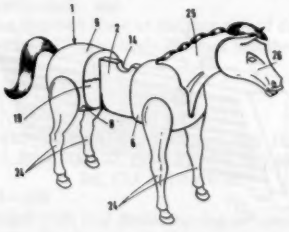
Dietmar Rahmstorf, Nurnberg, Germany, assignor to Messrs. BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag, Furth, Bayern, Germany

Filed July 28, 1976, Ser. No. 709,287

Claims priority, application Germany, Aug. 2, 1975, 7524554[U]

Int. Cl.² A63H *3/16*

U.S. Cl. 46—116 **6 Claims**

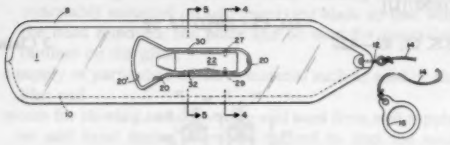


1. a quadruped toy animal figure of the type used to mount a rider comprising a rigid body capable of carrying a saddle, wherein the improvement consists in that the middle of the body is constructed from a narrow web extending in the longitudinal direction of the body between front and rear parts of generally naturally appearing proportion; a body centerpiece and a saddle each formed with respective means enabling either one of them to be selectably securely mounted on said web; said centerpiece being shaped at its outer surface to blend with the contour of the parts of the said body adjacent to the said web.

4,044,499
WHIRL TOY

Jacob A. Toler, 4900 Pembridge Ave., Baltimore, Md. 21215

Filed Mar. 31, 1976, Ser. No. 672,418
Int. Cl.[2] A63H *1/32, 33/26*
U.S. Cl. 46—228 4 Claims



1. An improved whirl toy including an elongated, thin, substantially flat body member having circular side surfaces and parallel edges and means at one end thereof for attaching a thong thereto for whirling the body member in a circular path, the improvement comprising:

a. said body member having an opening extending therethrough adjacent the center;

b. a light assembly fitted centrally of said opening including a casing of such dimensions as to house a battery and a light element;

c. said casing being hingedly supported within the opening at a point adjacent the rear end of the casing, the center of the casing being in a plane with the elongated axis of the body;

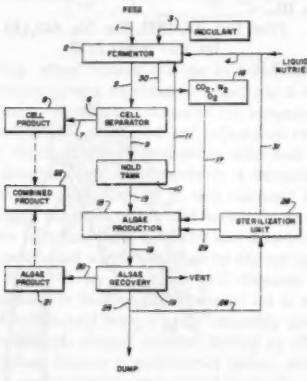
d. means at the opposite ends of the casing for releasably securing the casing to the opposite end of said opening;

e. a battery having means for electrically connecting the light element with the battery when the toy is put in a whirling circular path.

4,044,500
INTEGRATED FERMENTATION-PHOTOSYNTHESIS BIOMASS PROCESS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 9, 1974, Ser. No. 432,069
Int. Cl.[2] A01G *7/00*
U.S. Cl. 47—1.4 4 Claims

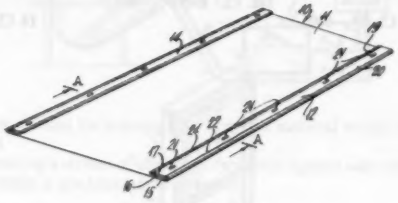


1. A process which comprises fermenting under aerobic conditions a fermentable feed selected from the group consisting of hydrocarbons, carbohydrates, alcohols, acids, aldehydes and industrial waste streams to produce a protein cellular product, separating the protein cellular product from the spent liquid fermentation effluent, recycling a portion of the spent liquid fermentation effluent to the fermentation and passing the remainder of the spent liquid fermentation effluent to a cultivation tank, inoculating, cultivating and propagating algal microorganisms therein while irradiating same with light, separating the algae from the waste liquid, sterilizing said last-mentioned waste liquid and then recycling the last-mentioned waste liquid to the fermentation.

4,044,501
SEED BED COVER WITH IMPROVED, REINFORCED EDGE SECTIONS

John Frydryk, Springfield, Mass., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 637,904, Dec. 5, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,917
Int. Cl.[2] B32B *3/04, 7/14*
U.S. Cl. 47—26 10 Claims

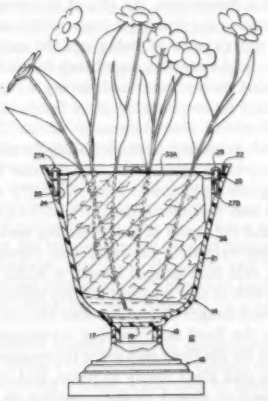


1. A flat, lightweight, porous, nonwoven fabric for use as a seed bed cover having improved, reinforced edge sections, each of said edge sections consisting of: multiple layers of said fabric in superimposed relationship on a side of said fabric, the layers of the edge section having an inside border facing the fabric and an outside border facing away from the fabric; a plurality of openings at spaced intervals through said multiple layers; and two flexible reinforcing bands on said edge section securing said layers together, each band extending in a continuous path along the length of the edge section, one band positioned between the openings and the inside border of the layers, the other band positioned between the openings and the outside border of the layers.

4,044,502
CONTAINER FOR FLOWERS

George C. Hillenbrand, Sabal Ridge Apts., Apt. 9N, 750 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Mar. 10, 1976, Ser. No. 665,629
Int. Cl.[2] A47G *7/07*
U.S. Cl. 47—41.12 4 Claims



1. A container for flowers which comprises a hollow body having a bottom and an annular wall terminating in an upwardly opening mouth, a plurality of lugs mounted on the

interior of the wall adjacent the mouth, there being upright sockets in the lugs, plugs mounted in the sockets, each of the plugs having a shank received in one of the sockets and a head overlying the lug associated therewith and flexible straps spanning opposed plugs, openings in the straps adjacent ends thereof receiving the plugs, the straps being adapted to hold a block of flower holding material in the container.

4,044,503

FRAME CONCEALED EXTERIORLY OPENING OPERATING SASH

Neil F. Maune, Ladue, Mo., assignor to Profile Systems, Inc., St. Louis, Mo.

Filed Sept. 29, 1975, Ser. No. 617,637
Int. Cl.[2] E05D *7/06*
U.S. Cl. 49—400 **14 Claims**

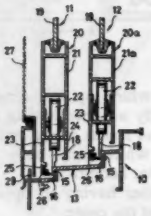
1. In a window structure for a building and of the type wherein its window frame presents a narrow profile, and its operating and fixed sashes present a zero line of sight through concealment behind their facades of the uniformly narrow fixed frame and operating sash structure, as when the operating sash is maintained in a closed position, said operating sash being an exteriorly opening sash, said window structure incorporating a glazed fixed sash and a glazed operating sash, a perimeter frame peripherally surrounding said sashes and capable of being permanently mounted to the building structure, an intermediate frame member of reinforced structure provided between said sashes and being fixed to said perimeter frame thereby forming the operating and fixed sash openings, said perimeter frame having jamb, sill, and head portions, said portions being of uniform semi-tubular structure, and when viewed exteriorly along with the intermediate frame member being of uniform dimensions, the glazed operating sash being hingedly mounted to the perimeter frame within said operating sash opening and capable of being opened outwardly with respect thereto, said operating sash being formed as a tubular like frame around its perimeter and having a reglet provided forwardly thereof for securing the glaze firmly in place and to allow its replacement from interiorly of the building, said glazed fixed sash including a retainer being formed of channel like structure around its perimeter, said retainer being removable to allow glaze replacement from interiorly of a building, those portions and the intermediate frame forming the fixed sash opening and the reglet of the operating sash having integral face flanges extending inwardly and outwardly respectively thereof, said face flanges having a width substantially less than the width of said portions and the intermediate frame member, said face flanges on said portions and the intermediate frame forming the fixed sash opening cooperating to form a continuous seat for the fixed sash glaze thereagainst their interior for holding said glaze firmly in place, said operating sash when maintained in closed position having its face flanges substantially concealing its tubular like frame and the perimeter frame therebehind, in addition to said fixed sash being substantially concealed behind its proximate face flanges as the window structure is viewed exteriorly.

4,044,504

SASH WINDOW WITH WEATHERTIGHT SEALING MEANS

Katsuo Nakada, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 28, 1976, Ser. No. 709,337
Claims priority, application Japan, Aug. 8, 1975, 50-110307[U]
Int. Cl.[2] E05D *13/02*
U.S. Cl. 49—425 **3 Claims**



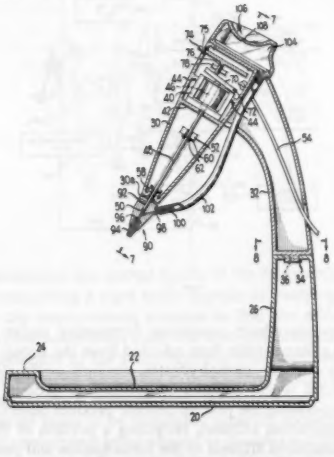
1. In a sash window of the type having at least two overlapping sashes independently movable horizontally within an outer frame, wherein each of the sashes includes an inner frame extending along and embracing the periphery of a panel, the improvement comprising a sill included in said outer frame, said sill being formed into a series of longitudinally extending steps decreasing in height toward the exterior of the window, said steps including risers, and at least a pair of upstanding rails formed by upward extensions of said risers respectively, said sashes being supported respectively on said rails for horizontal movement therealong, and a weathertight sealing strip carried by said inner frame of each of said sashes respectively in sliding engagement with the exterior surface of said risers.

4,044,505

ETCHING DEVICE FOR GLASS OR OTHER ETCHABLE SURFACES

Burton C. Meyer, Downers Grove, and Ralph J. Kulesza, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 18, 1975, Ser. No. 642,153
Int. Cl.[2] B28D *1/22*
U.S. Cl. 51—5 R **9 Claims**



1. An arts and crafts apparatus for etching designs on glass, plastic, or like etchable surfaces comprising:

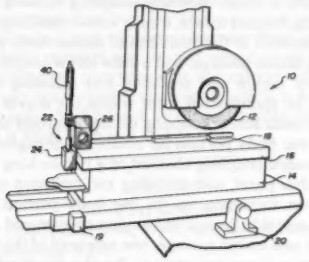
a housing;
an operative vibratory motor means mounted on said housing;
an engraving blade driven by said motor means,
a working head, including surface means engageable with an etchable surface, driven by said motor means through reciprocating vibratory strokes, said working head being removably mounted on said engraving blade so that with the head removed, the blade can be used for engraving outlines on the glass;
a supply of particulate abrasive material such as sand or the like; and
means for slowing and delivering said sand from said supply to said head during vibration thereof to trap the sand between said surface means and the glass piece to etch the glass piece by abrasive action of the sand.

4,044,506

METHOD AND APPARATUS FOR REFACING AN ABRASIVE WHEEL

Jun A. Taketa, 2343 Fir St., Glenview, Ill. 60025

Filed Apr. 29, 1976, Ser. No. 681,449
Int. Cl.² B24B *53/04*
U.S. Cl. 51—5 D **3 Claims**



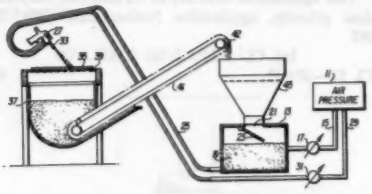
1. A grinding wheel refacer for use in combination with grinding apparatus having an abrasive wheel and a work bed supporting a magnetic chuck; a diamond bit; mounting means fixedly secured to said work bed and adjustably supporting said diamond bit in refacing relationship with said abrasive wheel, said mounting means comprising a mounting head having a bore extending through it, said diamond bit being slidably adjustably disposed within said bore, a finger cavity in communication with said bore, whereby said diamond bit can be adjustably positioned within said bore by extending a finger through said finger cavity to engage said diamond bit, and means for positionally locking said diamond bit at an established position within said bore; a gauge assembly comprising a generally rectangular-shaped member having an offset portion for supporting therein a micrometer means, said gauge assembly being removably secured to said magnetic chuck by the operation of the latter and supporting said micrometer means in operative relationship with said diamond bit such that said diamond bit can be adjustably positioned to engage said micrometer means, said micrometer means being adjustable to establish a fixed determinable dimensional relationship with respect to a work piece to be ground; whereby said diamond bit can be adjustably positioned to reface an abrasive wheel such that the radius of the peripheral face of said abrasive wheel corresponds to the finished dimension of the work piece.

4,044,507

METHOD AND APPARATUS FOR STRIPPING, CLEANING AND TREATING SURFACES

Fred L. Cox, Alexandria, Va.; Steve Crump, and Phate Hice, both of Morganton, N.C., assignors to Silver Creek Minerals Corporation, Morganton, N.C.

Filed May 12, 1976, Ser. No. 685,679
Int. Cl.² B24C *1/00, 9/00*
U.S. Cl. 51—424 **11 Claims**



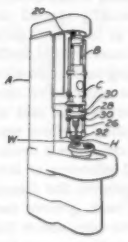
1. A method for treating a surface of a material which comprises
directing a stream of olivine grit material against said surface under a predetermined pressure.

4,044,508

ADJUSTABLE HONING TEMPLATE

Richard Frederick, 1560 Dennison, Dundee, Mich. 48131

Filed Mar. 26, 1976, Ser. No. 671,007
Int. Cl.² B24B *5/00*
U.S. Cl. 51—165.93 **16 Claims**



1. In a machine for increasing the diameter of holes in metals, and the like, having a spindle with a longitudinally extending axis of rotation and material removing elements which expand radially outwardly to increase the diameter of the hole, an improved diameter limiting device, comprising:
a plurality of template segments for engagement by said material removing elements, an annular holder having an axially extending opening therethrough for receiving the spindle of the machine, said annular holder having generally exially extending fingers respective ones of which support respective ones of said template segments, a camming ring concentric with said fingers, said fingers having abutment surfaces thereon which are moved radially upon rotation of said camming ring, and torque sensing means for sensing the torque exerted on said template segments by said material removing elements, and whereby the torque sensing means can be utilized to indicate that the hole in the work has been enlarged to a predetermined diameter.

15. An adjustable honing template comprising: an annular body member having a longitudinally extending opening therethrough for receiving a hone, a plurality of generaly parallel fingers extending longitudinally of said annular body member, a template segment on each finger with said template segments defining a circle, a rigid adjustment ring positioned opposite said fingers, and a camming surface advanced over said fingers by rotation of said adjustment ring for wedging said fingers

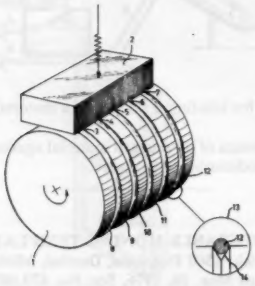
radially, and whereby the diameter of the circle defined by said template segments is changed by rotation of said adjustment ring.

4,044,509

METHOD OF AND DEVICE FOR GRINDING GROOVES

Jules Bos, and Gunter von der Kall, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 590,437, June 26, 1975, Pat. No. 4,011,692.
This application Oct. 26, 1976, Ser. No. 735,615
Claims priority, application Netherlands, July 5, 1974, 7409107
Int. Cl.² B24D *5/00*; B24B *1/00*
U.S. Cl. 51—206 P **4 Claims**



1. A method of forming a number of shallow mutually parallel grooves in a workpiece which comprises: providing a drum having a plurality of axially spaced circumferential grooves, each groove carrying at least one metal wire, each wire extending above the circumferential surface of said drum; providing means for rotating said drum about the axis thereof; and pressing the workpiece against the circumferential surface of said drum to form grooves with said wires.

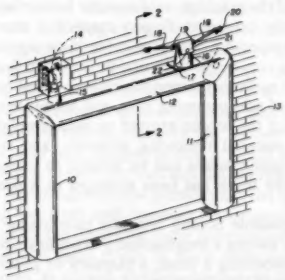
3. A device for grinding shallow mutually parallel grooves in workpieces which comprises a drum having a set of axially spaced circumferential grooves; at least one stretched metal wire carried in each groove, the dimensional relationship between each wire and each groove carrying said wire being such that said wire protrudes above the surface of said drum, said device further including means for rotating said drum.

4,044,510

VENTING VALVE FOR INFLATABLE DOCK SEALS

Larry O'Neal, 4953 Timbercrest Drive, Canfield, Ohio 44406

Filed Apr. 30, 1976, Ser. No. 681,797
Int. Cl.² E06B *7/22*
U.S. Cl. 52—2 **6 Claims**



1. In an inflatable dock seal for positioning on a wall around an opening therein and having means for inflating the same, a quick venting valve in communication with said inflatable dock seal and comprising a flexible tubular member extending outwardly therefrom, means normally supporting said flexible tubular member inwardly of the ends thereof so that a portion of the flexible tubular member is held in position outwardly of the inflatable dock seal and another portion of the flexible tubular member is unsupported and normally folded inwardly against the supported portion so as to form a closure in said flexible tubular member, said flexible tubular member arranged to temporarily unfold and open responsive to increased air pressure in said inflatable dock seal as occasioned by a truck or a trailer striking the inflated dock seal.

4,044,511

FASTENING MEANS FOR FRAMELESS INSULATING PANELS

Cleo M. Lingle, 1201 Montclair, Longview, Tex. 75601

Filed Oct. 8, 1976, Ser. No. 730,849
Int. Cl.² E04B *2/82, 1/90*
U.S. Cl. 52—127 **5 Claims**

1. A locking bar assembly adapted for embedment bodily in the foam insulation core of a frameless metal faced structural panel adapted to be joined in edge-to-edge assembled relationship with other panels, said assembly comprising a bar body portion, mounting bracket means secured to one end of the bar body portion, a female threaded coupling element secured to the mounting bracket means, a male screw shielding and retaining means secured to the other end of the bar body portion and defining an access passage, and a male screw coupling element held loosely within said shielding and retaining means and adapted to be manipulated from within the access passage to project the male screw coupling element beyond the adjacent end of the bar body portion for rotational engagement with a female threaded coupling element of a like locking bar assembly of another panel, said shielding and retaining means comprising a box formation on the bar body portion projecting away from one side thereof and having an open end defining an entrance to said access passage, one side wall of the box formation having a clearance opening for the shank of said male screw coupling element, said shielding and retaining means additionally comprising an arched shield for the shank of the male screw coupling element at one side of the box formation and being secured to said bar body portion, a transverse channel bracket secured to the bar body portion and containing said arched shield and having side wall openings receiving said shank which are coaxial with said clearance opening of said box formation, and a puncturable sheet material element on the outer side wall of said channel bracket covering the adjacent side wall opening and blocking premature extension of said male screw coupling element beyond the adjacent end of the locking bar assembly.

4,044,512

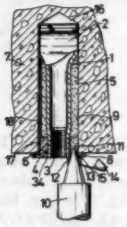
METHOD AND ARRANGEMENT FOR ANCHORING AN OBJECT TO A SUPPORT STRUCTURE

Artur Fischer, and Klaus Fischer, both of Tumlingen, Germany, assignors to Artur Fischer, Tumlingen, Germany

Filed Nov. 11, 1975, Ser. No. 631,153
Claims priority, application Germany, Nov. 14, 1974, 2453957; June 6, 1975, 2523198; June 6, 1975, 2525220; June 7, 1975, 2525452; June 14, 1975, 2526744; June 21, 1975, 2527773
Int. Cl.² E04B *1/41*
U.S. Cl. 52—127 **34 Claims**

1. An arrangement for anchoring an object to a support structure having an anchoring hole, comprising an anchoring

element including an anchoring member of transverse dimensions smaller than, and a cap member of transverse dimensions substantially corresponding to those of the anchoring hole, said anchoring member having a leading and a trailing end portion, an interior extending between said end portions, and an internal thread in said interior at said trailing end portion, said cap member externally embracing said trailing end portion of said anchoring member upon insertion of said anchoring element into the anchoring hole through an open end thereof so that said cap member supports said anchoring element at the open end of the anchoring hole with clearance between the latter and said anchoring member and closes the open end of the clearance; and means for filling the clearance with a body of



hardenable material for the latter to harden in the clearance about said anchoring member to thereby anchor said anchoring element in the anchoring hole, including at least one flow-through passage passing through said leading end portion of said anchoring member between said interior of the latter and the clearance, shielding means adapted to communicate with said passage for introducing the hardenable material thereinto and through the same into the clearance and to shield said internal thread of said anchoring member from contact with the hardenable material, and venting means at said cap member communicating the clearance with the exterior of the support structure and operative for venting air which is present in the anchoring hole and displaced by the hardenable material as the clearance is filled with said body.

4,044,513

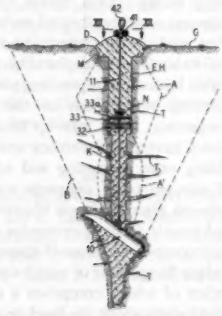
EARTH ANCHOR

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Continuation-in-part of Ser. No. 535,428, Dec. 23, 1974, Pat. No. 3,969,854. This application Mar. 19, 1976, Ser. No. 668,695

Int. Cl.² E02D *5/80, 5/58*

U.S. Cl. 52—163 **10 Claims**



1. A ground anchor which comprises an elongated rigid hollow tubular member having a leading driving end with an internal abutment adapted to be impacted by a driving tool and an open trailing end with an out-turned lip on one side thereof, an external cable anchor intermediate said ends on the side of the member opposite said lip side, said cable anchor being positioned rearwardly of the center of mass of the member so that when the member is suspended from a cable attached to the anchor, the leading end of the member will be at a lower level than the trailing end, said member adapted to slidably receive a driving and guiding tool for impacting against said abutment to drive the member and guide it upright into the ground, and said member when driven into the ground to a desired depth adapted to be rotated about said lip and plow laterally into the ground when a cable attached to the cable anchor is tensioned.

4,044,514

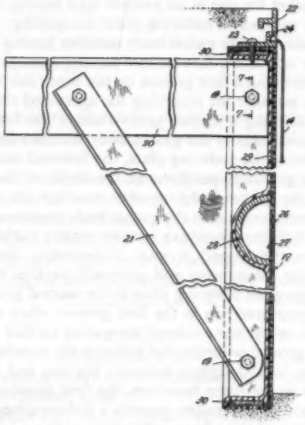
IN GROUND SWIMMING POOL FRAMEWORK

Philip N. Rubin, Trumbull, and Michael Fleming, Easton, both of Conn., assignors to Fairfield Fiberglass Inc., Fairfield, Conn.

Filed Dec. 19, 1975, Ser. No. 642,556

Int. Cl.² E04H *3/18*

U.S. Cl. 52—169.7 **10 Claims**



1. An in ground swimming pool framework that rests on an earth foundation for supporting a water containing flexible liner comprising a plurality of horizontally aligned elongate panels, each of said panels having a pair of horizontal and vertical edges and a smooth inner surface adapted to be engaged by the liner, peripheral flanges formed to extend from each edge rearwardly with respect to the inner surface at least along the vertical and bottom edges with the flanges having essentially flat exterior surfaces, means joining the vertical flanges of adjacent panels together to define a vertical upper wall of an in ground depression with the flat horizontal bottom surfaces of the flanges resting on the earth surface of the depression and liner support means securable to the top horizontal edge of the panels for retaining the peripheral edge of the liner and in which each of the panels is formed in situ as a one-piece unit of material consisting essentially of hardened plastic material having glass fiber strands embedded therein, said plastic material and glass fiber strands being shaped and of sufficient thickness to cause the panels to be horizontally and vertically rigid and self-supporting with said plastic material and glass fiber strands supplying essentially all of the rigidity of the panel.

4,044,515

GASKET FOR AN AVIONIC TRAY

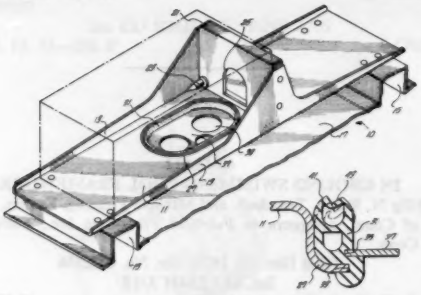
Robert A. Hollingsead, Yorba Linda, and Clyde Robert Pryor, Anaheim, both of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Santa Fe Springs, Calif.

Division of Ser. No. 399,961, Sept. 24, 1973, Pat. No. 3,871,937, which is a division of Ser. No. 125,561, March 18, 1971, Pat. No. 3,771,023. This application Nov. 29, 1974, Ser. No. 528,027

The portion of the term of this patent subsequent to Nov. 6, 1990, has been disclaimed.

Int. Cl.[2] H05K *7/20*; E04B *1/62*

U.S. Cl. 52—173 R **13 Claims**



1. A gasket for use in an avionic tray having an apertured rim and a removable metering plate comprising:

an annular flexible gasket body member having an inner and outer side and a first hollow annular passageway;

means defining a first groove on the outer side of the gasket body member for receiving the apertured rim;

means defining a second groove above the first groove on the inner side of the gasket body member for detachably receiving the metering plate, the first and second grooves being generally parallel and, the depth of the first groove into the gasket body member overlaps the depth of the second groove into the gasket body member; and

means defining a concave annular sealing surface extending above the second groove, immediately above the first annular passageway and generally parallel therewith for wedging the metering plate in the second groove towards the apertured rim in the first groove when a force is exerted on the same side of the sealing surface means as the first groove whereby the gasket body member is progressively locked tighter between the rim and the metering plate as the force increases, the first annular passageway surface configuration permits a deformational movement of the gasket body member by any force applied against the sealing surface area of the gasket body member while maintaining a continual planar sealing surface throughout the length of the gasket body member.

4,044,516

AIR TERMINAL BUILDING

Karl Lennart Billgren, Grev Magnigatan 4, 114 55 Stockholm, Sweden

Filed Sept. 8, 1975, Ser. No. 610,959

Int. Cl.[2] E04H *6/00*

U.S. Cl. 52—174 **9 Claims**

1. An air terminal building having a central portion and an outer peripheral portion, an arrival hall for passengers arriving at the building by airplane, a departure hall for passengers departing the building by airplane, a baggage hall commonly used for baggage of both arriving and departing passengers, said arrival, departure and baggage halls being located on different levels in said central portion of said building with said baggage hall being located on a level between the levels of said arrival and departure halls, and a waiting hall commonly used for both arriving and departing passengers, said waiting hall being located in said outer peripheral portion of said building, said outer peripheral portion being located at a level above the levels of said arrival, departure and baggage halls.

4,044,517

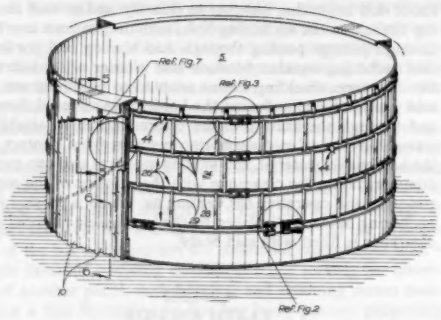
INSULATED TANK JACKETING SYSTEM

Richard C. Schroter, Orinda, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 12, 1976, Ser. No. 704,725

Int. Cl.[2] B65D *25/16*

U.S. Cl. 52—248 **8 Claims**



1. An insulated jacketing system for an upstanding cylindrical tank wall and the like comprising at least one pretensioned circular track means made up of a plurality of individual track segments each having multi-perforated ends disposed immediately adjacent the tank wall and each of which is provided with an outwardly facing recess, means for splicing certain opposing and adjacent multi-perforated ends of selected track segments together, said means comprising a splice plate provided at each of its ends with a plurality of struck out lug portions engageable with a corresponding plurality of similarly shaped and matching perforations on the said ends of the selected track segments, track take-up means including rod elements and plates having multi-struck out lug elements engaging and holding other opposing and adjacent multi-perforated ends of selected track segments together, the splice plate and the take-up plate each are channel shaped in cross section, insulated panels secured crosswise to said track segments, said panels comprising channel-shaped sections having opposing upstanding flanges one of which comprises a terminal bead and the other of which comprises a deformable sleeve that can be folded tightly about the bead on a similarly configured channel-shaped section disposed adjacent thereto, insulating material affixed to the underside of each panel and clip means provided with a head portion insertable within and engageable with the bead of one panel and a foot element insertable within the outwardly facing recess of a track segment.

4,044,518

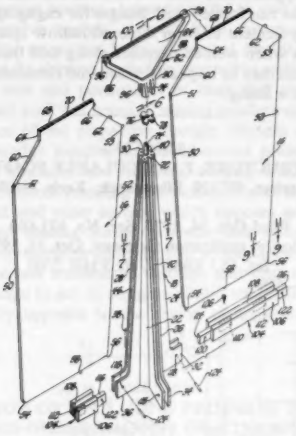
BUILDING STRUCTURE

John S. Hodge, 2350 Westridge Court, Ferndale, Mich. 48220

Continuation of Ser. No. 635,048, Nov. 25, 1975, abandoned, which is a continuation of Ser. No. 520,374, Nov. 4, 1974, abandoned, which is a division of Ser. No. 340,595, March 12, 1973, Pat. No. 3,861,102. This application June 7, 1976, Ser. No. 693,334

Int. Cl.[2] F04H *12/00*

U.S. Cl. 52—301 12 Claims



1. A structural column assembly, comprising vertically extending elongated column main body means, said main body means comprising an upper first top end and a lower first base end, a plurality of first groove-like recess means formed in said main body means and extending generally longitudinally thereof, said first groove-like recess means being of generally unifor, width along the entire length of said first groove-like recess means, and said first groove-like recess means being inclined with respect to the vertical as to have said first groove-like recess means more nearly approach each other as the elevation of such first groove-like recess means increases from said lower base end, and secondary body mens situated atop said main body means, said secondary body means comprising a second upper top end and a second lower base end, said lower base end being adapted as to be vertically operatively supported by said first top end, said secondary body means further comprising a plurality of second groove-like recess means formed in said secondary body means and extending generally vertically, at least certain of said second groove-like recess means being aligned with at least certain of said first groove-like reces means, said second groove-like recess means having at least portions thereof inclined with respect to the vertical as to have upper portions thereof further spaced from each other generally as the elevation thereof increases from said second lower base end.

4,044,519

INSULATED DOUBLE GLASS WINDOW ASSEMBLY

Wilfred F. Morin, 326 E. Taylor St., Suite B, Reno, Nev. 89502, and Joseph A. Martini, 6555 Plumas St., Reno, Nev. 89501

Filed May 7, 1976, Ser. No. 684,226

Int. Cl.[2] G02B *5/24;* E06B *7/00, 3/24*

U.S. Cl. 52—304 5 Claims

1. An apparatus for selectively varying the color of a window, said apparatus comprising:

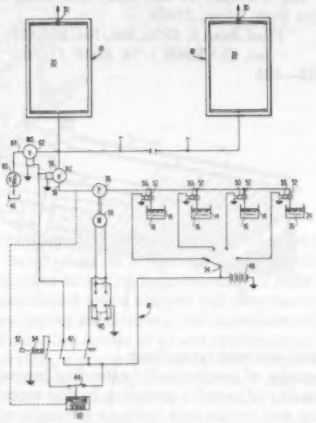
a double pane window assembly comprising two at least generally parallel, spaced transparent or translucent panes defining a volume therebetween,

at least three liquid reservoirs containing respectively two different colored antifreeze liquids and a cleaning liquid capable of removing residue antifreeze liquid from said window volume,

conduit means for connecting said liquid reservoirs to said double pane window assembly and opening to said volume,

a pump operatively positioned within said conduit means intermediate of said liquid reservoirs and said double pane window assembly,

solenoid valve means within said conduit means between each liquid reservoir and said pump for selectively connecting said pump to a given liquid reservoir,



a reversible electric motor for driving said pump,

switch means for controlling reversible energization of said pump motor, and

selector means for preventing energization of more than one of said solenoid means such that between pumping of different colored antifreeze liquids to and from said window volume assembly, said cleaning liquid may be pumped from its liquid reservoir to said window assembly to flush residue antifreeze liquid from said volume.

4,044,520

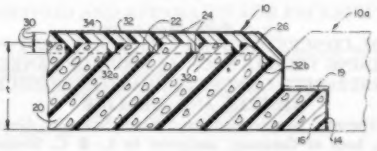
BUILDING PANEL

Albert G. Barrows, West Haven, Conn., assignor to John P. Bogiovanni, Chester, Conn.

Filed July 21, 1975, Ser. No. 597,659

Int. Cl.[2] E04C *2/10*

U.S. Cl. 52—309.12 13 Claims



1. An exterior wall panel adapted for assembly with other similar panels, and comprising a base of heat insulating material, said base having a generally regular polygonal configuration and having at least one side defining a projecting edge adapted to mate with a cavity defined in the adjacent side of an identical adjacent panel, said base having a rear face adapted for attachment to a structure or the like, and having a front face defining grooves oriented generally perpendicularly with respect to said projecting edge, and a polymer fortified cementitious facing on said front face of said base, said facing having a thickness in the range of $\frac{1}{8}$ to $\frac{1}{4}$ inch, said facing including

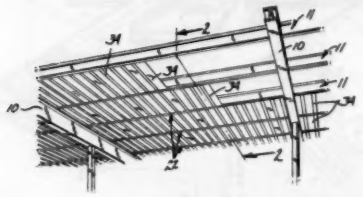
rearwardly projecting ribs integrally formed in the facing which ribs fill said grooves in the base to a depth at least as great as that of said facing thickness, and a layer of polymer material adhered to the facing, said front face of said base has a bevelled edge, and wherein said facing also includes a bevelled edge such that an overhanging portion of the facing projects inwardly thereof to further reinforce the base.

4,044,521

ROOF INSULATION SUPPORT SYSTEM

Larry J. Fischer, 809 108th Lane, NW., Coon Rapids, Minn. 55433, and Terrence J. McNellis, 608 82nd Ave., North, Brooklyn Park, Minn. 55444

Filed June 3, 1976, Ser. No. 692,488
Int. Cl.[2] E04B *1/74*; E04F *15/18*
U.S. Cl. 52—404 **11 Claims**



1. A roof structure comprising:

a. a plurality of longitudinally extending beams;

b. a plurality of laterally extending purlins supported by said beams, said purlins each having a vertically oriented webb having a bottom edge, a bottom flange perpendicular to said webb and extending horizontally from said bottom edge of said webb, said bottom flange having an outer edge and a bottom surface, and a lip portion extending upwardly from said outer edge of said bottom flange so that said lip portion is parallel to said webb portion;

c. an elongated liner support member depending from each of said purlins, each said liner support member having a generally inverted T-shaped cross section comprising a lower horizontal portion, an upstanding portion perpendicular to said horizontal portion, and clip means to engage said lip portion of said purlin to support said liner support member; and

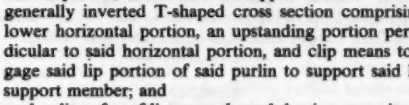
d. a plurality of roof liner panels each having opposite side edges, said panels being laid horizontally between adjacent pairs of said purlins, supported by said side edges overlying said lower horizontal portions of adjacent pairs of said liner support members depending from said adjacent pairs of purlins.

4,044,522

STEEL-CONCRETE COMBINATION ELEMENT FOR LINING VESSELS SUCH AS STORAGE TANKS, PRESTRESSED CONCRETE REACTOR PRESSURE VESSELS, AND THE LIKE

Horst Sturmer, Bergneustadt, and Klaus Schweim, Gummersbach, both of Germany, assignors to L. & C. Steinmuller G.m.b.H, Gummersbach, Germany

Filed July 23, 1975, Ser. No. 598,548
Claims priority, application Germany, July 24, 1974, 2435521
Int. Cl.[2] E04C *2/04*; E04B *1/54*
U.S. Cl. 52—599 **1 Claim**



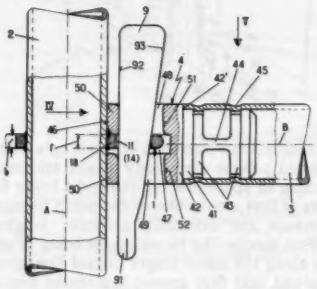
1. A self-supported compound element of steel and concrete for joining to similar elements for lining containers, including a steel plate base member, a plurality of individual anchoring means fixed on one surface of said plate, a rim along at least one edge of said plate and fixed on the same surface as said anchoring means, concrete cast on said surface of said plate and having a surface substantially parallel with the plate surface with said anchoring means extending into said concrete and said rim confining said concrete along said edge, certain of said anchoring means extending above said concrete surface and said rim, said rim having flanges projecting laterally outwardly on the side opposite said concrete to form one-half of a hollow formation, the rim formed with flanges for engaging flanges of an adjoining element to form a closed hollow space between the elements when welded together along said flanges, so the welding seams may be inspected when said elements are assembled to form a lining.

4,044,523

FRAME STRUCTURE, PARTICULARLY SCAFFOLDING

Eberhard Layher, D7129 Eibensbach, Kreis Heilbronn, Germany

Filed Oct. 14, 1975, Ser. No. 621,660
Claims priority, application Germany, Oct. 16, 1974, 2449124
Int. Cl.[2] E04G *7/00*; F16B *7/00*
U.S. Cl. 52—638 **11 Claims**



1. A frame structure, particularly a scaffolding, comprising a plurality of tubular upright elements each having an upright axis and an outer surface; a plurality of bracing elements each having two elongated end portions each of which has a longitudinal slot of a predetermined width and subdividing the respective end portion into two sections which have registering openings extending substantially normal to the elongation of the respective end portion; means for connecting at least some of said bracing elements to said upright elements to obtain a basic rectangular grid of said bracing elements, including a number of circumferentially complete ring flanges so supported on each of said upright elements as to circumferentially embrace the same with axial spacing from one another and each having a thickness at most equal to said width of said slot so as to be receivable therein so that said sections of the respective end portion straddle said flange, a plurality of first cut-outs extending through the respective flange and having respective radial axes located in a common plane normal to said upright axis and which intersect at the latter and are normal to each other in said plane, and a plurality of wedge members each receivable in said registering openings of the respective end portion to extend across said slot thereof and through one of said first cut-outs, the latter being of substantially barrel-shaped configurations so that a partly advanced wedge member is receivable therein even when the elongation of said respective end portion deviates from the respective radial axis, while further advancement of said wedge member results in alignment of said elongation with said respective radial axis; means for connecting other bracing elements to said flanges for each of said other bracing elements to extend from

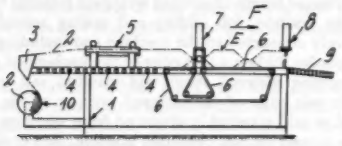
the respective flange in a direction different from those of said radial axes, including a plurality of second cut-outs extending through the respective flange intermediate said first cut-outs and being of such shapes that a respective one of said wedges can be received therein in the fully advanced position thereof even when the elongation of said end portion of the respective other bracing element is located in a plane deviating from the radial direction of said flange; and means for at least suppressing shearing stresses in the zone of juxtaposition of said flange with said upright element by transmitting loading forces acting on the respective bracing element parallel to said upright axis of the respective upright element from the respective end portion of the respective bracing element directly to the respective upright element, including respective endfaces on said sections of said end portions of at least said some bracing elements, said endfaces being of mating configurations to said outer surface of the respective upright element so that the respective wedge member in the advanced position thereof presses said endfaces into frictional contact with said outer surface with a force resulting in a frictional force between said endfaces and said outer surface which opposes and compensates for said loading forces, whereas said wedge member simultaneously subjects said flange to a counterforce opposite to said force and transmitted through said circumferentially complete flange to act on a region of said outer surface which is diametrally opposite to the region of application of said force.

4,044,524

METHOD OF PACKAGING PRODUCTS TO BE PRESERVED UNDER VACUUM OR ATMOSPHERE OF SUITABLE GASES

Luigi Segale, Via Nullo 5, Caravaggio (Bergamo), and Pier Enrico Passerini, Via Arco 13, Rho (Milan), both of Italy

Division of Ser. No. 628,380, Nov. 3, 1975, Pat. No. 3,995,407. This application Sept. 13, 1976, Ser. No. 722,738
Claims priority, application Italy, Nov. 12, 1974, 29328/74
Int. Cl.² B65B *31/08*
U.S. Cl. 53—22 A **8 Claims**



1. A method for packaging a product in a controlled atmosphere comprising the steps of:

wrapping the product with a length of flexible sheet material;

sealing the longitudinal edges of said material to form a package for the product;

carrying out a first transverse seal to close the package with a pair of opposed sealing electrodes;

communicating with the interior of the package with a hollow needle by piercing the sheet material to produce a hole therein and effect said controlled atmosphere;

carrying out a further transverse seal at such a position that the needle-produced hole is isolated between the two seals and not in communication with the package interior containing the product with a second pair of opposed sealing electrodes; and

supporting said first and second transverse sealing means and said communicating means for longitudinal rectilinear movement thereof;

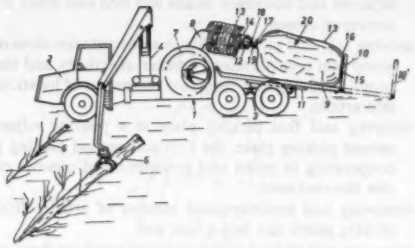
said first transverse sealing step, said communicating step, and said second transverse sealing step being sequentially carried out while said wrapped product is moved in a feed direction of said sheet material.

4,044,525

METHOD AND MACHINE FOR PACKING WOOD CHIPS

Ernst Erik Forsgren, Hudiksvall, Sweden, assignor to Anders Eric Sundin, Sweden, a part interest

Continuation of Ser. No. 568,815, April 17, 1975, abandoned. This application June 8, 1976, Ser. No. 694,191
Int. Cl.² B65B *1/20*
U.S. Cl. 53—24 **6 Claims**



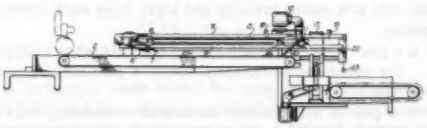
1. An improved method for packaging wood chips comprising, making wood chips in a mechanical wood chipper by feeding waste wood including large branches of trees and tree tops to the mechanical wood chipper and simultaneously mechanically developing an air stream for immediately discharging the wood chips in a stream of air and principally as a stream of wood chips along a discharge path of flow, before discharging the wood chips along said dishcarge flow path defining a terminal length of said discharge flow path and the volume of chips that can flow along said discharge path of flow with an air-permeable, packaging tube of variable length disposed in an axially folded condition to receive the discharge stream of air and wood chips for storing thereof as a package, said tube having a closed end terminating flow of said wood chips internally of the tube, automatically filling the tube defining the terminal length of the discharge flow path with said stream of air and wood chips while progressively feeding said air-permeable tube along said flow path under control of wood chips impelled along said flow path by air thereby varying the length of the terminal length of the flow path in dependence upon the length of the package intended and while filling the tube simultaneously venting the air in said stream through said air-permeable tube at a rate to pack the wood chips as said tube fills with wood chips, before filling said tube positioning a stop for determining the terminal length of the tube by determining the position at which said closed end thereof will engage said stop, and removing the filled tube as a storable package.

4,044,526

METHOD AND APPARATUS FOR PACKAGING TUBULAR ARTICLES

Roger Lafleur, Greenfield Park, Canada, assignor to Imasco Limited, Montreal, Canada

Filed Oct. 26, 1976, Ser. No. 735,275
Int. Cl.² B65B *35/40, 19/34*
U.S. Cl. 53—26 **9 Claims**



1. A method of packing a predetermined number of articles which comprises,

ascertaining the number of said articles which pass a counting means;

arranging said articles in a row on conveyor means; said counting means being capable of actuating separator means to locate and cease downstream movement of a said article and thereby create a space between a predetermined number of said articles which have passed said separator means and following articles on said conveyor means;

actuating a first picking plate into a dropped position onto or adjacent said conveyor means and into said space on said conveyor means;

moving said first picking plate in a downstream direction to scoop said predetermined number of articles, and simultaneously moving said separator means out of location with said article;

stopping said first picking plate at a position adjacent a second picking plate, the first and second picking plates cooperating to retain said predetermined number of articles therebetween;

removing said predetermined number of articles from the picking plates and into a box; and

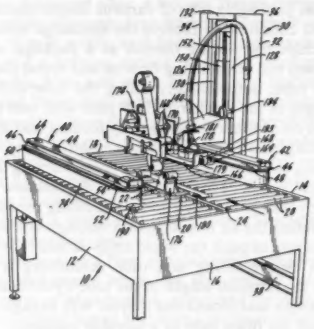
returning said picking plates to initial positions from repeating the packaging operation.

4,044,527

APPARATUS FOR SEALING CONTAINERS

Lawrence Walter Ulrich, and Connie Wayne Walker, both of Bolingbrook, Ill., assignors to Durable Packaging Corporation, Chicago, Ill.

Filed June 28, 1976, Ser. No. 700,170
Int. Cl.[2] B65B *7/16*
U.S. Cl. 53—137 **7 Claims**



1. Apparatus of the type used for sealing the foldable flaps of cartons of random sizes, said apparatus including a frame structure, a vertically movable sealing head means mounted to said frame structure, and carton conveying means having a pair of facing longitudinally extending side arm means mounted to said frame structure so as to permit transverse movement of said side arm means towards and away from each other, said side arm means having endless conveyor belts engageable with opposite sides of said carton to move same through said sealing head means; an improved mechanism for transversely moving said side arm means towards and away from each other comprising:

a. a pair of longitudinally spaced sprocket wheels supported for simultaneous rotation about a substantially vertical axis;

b. a pair of substantially horizontal connecting rods associated with each of said sprocket wheels, each of said connecting rods having first ends pivotally secured to said sprocket wheels and second ends pivotally secured to corresponding ends of said side arm means; and

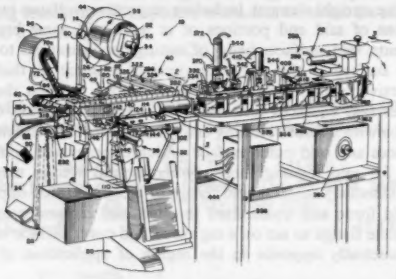
c. means for rotating said sprocket wheels in a clockwise and counter-clockwise direction, such rotary motion of said sprocket means being translated to linear motion at said side arm means through said connecting rods.

4,044,528

METHOD AND APPARATUS FOR FORMING SEALED PACKAGES

James Harold Black, Quinton, and Vernon C. Stant, Richmond, both of Va., assignors to American Brands, Inc., New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,791
Int. Cl.[2] B65B *5/02*
U.S. Cl. 53—192 **27 Claims**



1. In an automatic wrapping machine adapted for wrapping and sealing a package made from a foil of thin, flexible, and heat-sealable wrapping material in which said machine includes a support means, a rotatable indexing turret means carrying a plurality of discrete forming mandrels which are circumferentially spaced with respect to each other and are successively rotated in an intermittent step-by-step fashion from a first operating position to at least second, third and fourth operating positions, and a clamping means being effective to clamp a portion of the wrapping material to respective ones of the mandrels at said first operating position, the improvement comprising, foil supply and cutting assembly means operatively connected to said support means for advancing a predetermined length of severed wrapping material to said first operating position, foil folding and sealing assembly means operatively connected to the machine and including foil folding means for folding a side edge of the unclamped portion of the wrapping material about said mandrel and toward the opposite side edge of the clamped portion of the wrapping material as said mandrel is advanced from said first operating position to said second operating position, side sealing means for heat sealing the opposed side edges together at said second operating position to thereby form a side fin seal, fin folding means for folding the formed side fin seal at said third operating position, bottom fin forming and sealing means for forming and heat sealing a bottom fin seal at said third operating position, top fin forming and sealing assembly means operatively connected to said machine for forming and sealing a top fin seal on respective ones of the packages, transfer assembly means operatively mechanically connected to said support means and said machine for selectively transferring a partially formed package filled with the article to be packaged from respective ones of said mandrels to said top fin forming and sealing assembly means, said transfer assembly means including an indexing transfer wheel having a plurality of discrete circumferentially spaced radially extending pockets, each of which is adapted to receive respective ones of the partially formed packages whenever ejection means of said indexing turret means is operated and for selectively transferring the ejected partially formed package circumferentially to a deposit position, first and second and third pusher means mechanically operatively connected to said support means, said first pusher means located adjacent said deposit position and being operable for pushing the package from the indexing transfer wheel, conveying means connected adjacent said first pusher means for enabling conveyance of a plurality of the packages which are pushed by

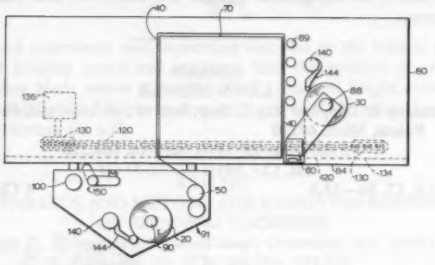
said first pusher means along a path, said second pusher means operatively connected to said support means adjacent an end of the path defined by said conveying means and being actuatable for pushing respective ones of the packages from said conveying means, said second pusher means including mechanical switch means operatively connected to said second pusher means and being operable to actuate said second pusher means upon operative contact therewith by respective ones of the packages, said third pusher means connected to said support means and being actuatable for delivering ones of the packages to said top fin forming and sealing assembly.

4,044,529

PALLET STRETCH-WRAP APPARATUS

Seymour Zelnick, Somerville, N.J., assignor to Weldotron Corporation, Piscataway, N.J.

Filed Apr. 27, 1976, Ser. No. 680,849
Int. Cl.² B65B *13/08*
U.S. Cl. 53—198 R **33 Claims**



1. Apparatus for stretch-wrapping a load with stretchable film comprising

a fixed first roll,

a second roll including first means for moving said second roll toward and away from said first roll,

wrapping film wound on said rolls and forming a continuous curtain between said first and second rolls, said second roll being movable along a first path from a first position remote from said first roll to a second position adjacent to said first roll,

second means defining a load path extending across said first path and moving a load along said load path into and beyond said film curtain whereby said film partially envelops said load, operation of said first means to move said second roll toward said first roll causing said film to completely envelop said load, and

sealing means for sealing said film about said load.

4,044,530

APPARATUS FOR GUIDING AND CUSHIONING A PLURALITY OF ARTICLES AS THEY MOVE INTO A CONTAINER

David E. Phillips, Forest, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Jan. 22, 1975, Ser. No. 543,069
Int. Cl.² B65B *5/08*
U.S. Cl. 53—248 **45 Claims**

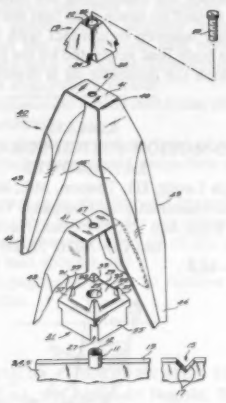
1. In an apparatus for guiding and cushioning a plurality of articles adapted to be deposited into a container positioned below said apparatus, the combination comprising:

a. a support;

b. a plurality of elongated members mounted on said support spaced from one another to define therebetween a plurality of unobstructed elongated spaces open at top and bottom with each space bounded on its sides by adjacent ones of said members;

c. guides mounted on and exposed at the upper portions of said members at intervals spaced along said members and having portions overhanging said members and extending over said spaces to define a row of vertical passages subdividing said elongated spaces with each of said passages being bounded in part by two of said members and in part by said guides, each of said articles being adapted to be deposited into a container through one of said passages;

d. flexible fingers secured to said members and extending inwardly of said passages, adjacent fingers of adjacent passages being connected to one another to define a unit



having a mounting section adapted to be secured to an associated member, from which mounting section said fingers extend inwardly of said adjacent passages; and

e. means for fastening said finger mounting section between a guide and said associated member;

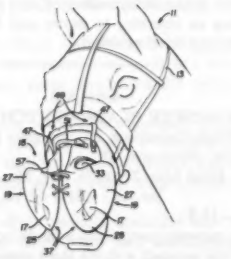
whereby as the article approaches the apparatus it is initially moved into proper position in said passage by said guide and then further guided by said flexible fingers so that it is deposited into the container.

4,044,531

PROTECTIVE NOSE SHIELD FOR RACE HORSES AND THE LIKE

John L. Marchello, 9934 Daleview, South Lyon, Mich. 48178, and Gerald F. Trotter, 43263 Eleven Mile Road, Novi, Mich. 48050

Filed Apr. 26, 1976, Ser. No. 680,066
Int. Cl.² B68C *5/00*
U.S. Cl. 54—80 **9 Claims**



1. A protective nose shield for race horses and the like whose head and face portions normally carry bridle means, said protective nose shield comprising a pair of reverse air scoop members and fastening means operably coupling said air scoop members to said bridle means and about portions of said horses face for adjustably positioning each of said air scoop members over one of the horse's nostrils, each of said air scoop members including a domed portion forming an air space about

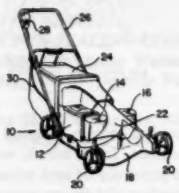
the nostril, a rearwardly flared deflection surface integral with the front of said domed portion for diverting foreign debris and cold air away from the nostril area, said domed portion including an inwardly facing rim portion adapted to rest comfortably against the horse's face and to fit relatively closely thereto to prevent the passage of cold air or foreign debris into said air space from the front or side of said domed portion, and a rearwardly facing breathing port in the rear of said domed portion at the opposite end of said domed portion from said deflection surface for channeling the inhaled and exhaled air into and out of said air space such that the cold incoming air is at least slightly warmed by contact with the warmer exhaled air and by the body heat generated by the portion of the horse's face over which the incoming air is drawn.

4,044,532

TWO-MOTION SWITCH FOR CORDLESS LAWNMOWER

William Ralph Lessig, III, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 25, 1975, Ser. No. 607,635
Int. Cl.[2] A01D 75/20
U.S. Cl. 56—10.5 **12 Claims**



1. A switch-operating mechanism for an electric tool including a working output member, an electric motor for driving said output member, wire means for connecting said motor to a source of electric power for energization thereof, a switch for controlling the connection of said motor to said source, and a switch operating mechanism, said mechanism comprising a switch-operating lever movable between a first position wherein said switch is off and said motor is disconnected from said source, a second position wherein said switch is on and said motor is connected to said source, and a third position intermediate said first position and said second position wherein said switch is off; a housing having an aperture therein for receiving said lever in said first position, said aperture being shaped to substantially completely enclose said lever in a close fitting manner to prevent operator access thereto when said lever is in said first position; and means associated with said housing while being independent of said aperture and of said lever enabling an operator to move said lever from said first position into said third position.

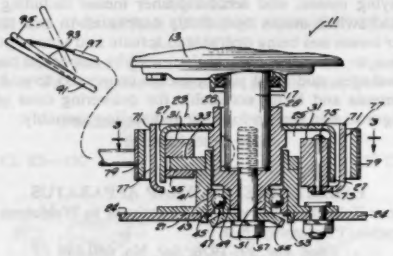
4,044,533

LAWN MOWER BLADE CLUTCH AND BRAKE

Gerald H. Wick, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 27, 1976, Ser. No. 690,632
Int. Cl.[2] A01D 69/10
U.S. Cl. 56—11.3 **20 Claims**

1. A lawn mower comprising a blade housing supported for travel over the ground, a drive shaft mounted for rotation by said blade housing and including thereon a clutch drum, an engine drivingly connected to said drive shaft for rotation thereof, a cutter blade located in said blade housing and mounted for rotation coaxially with and relative to said drive shaft, a clutch shoe connected to said cutter blade for common rotation therewith and for movement relative to a position of engagement with said clutch drum, biasing means urging said clutch shoe into said position of engagement, a brake surface fixed to said clutch shoe, and a brake member movable between a first position wherein said brake member is spaced from said brake surface, and a second position wherein said brake member engages said brake surface to brake rotation of



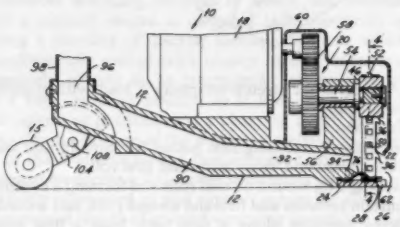
said cutter blade and to displace said clutch shoe from said position of engagement against the action of said biasing means.

4,044,534

LAWN MOWER

Stanley R. Day, and Ray E. Day, both of 340 Lakeland, Grosse Pointe, Mich. 48230

Filed Mar. 18, 1976, Ser. No. 668,315
Int. Cl.[2] A01D 87/10, 55/24
U.S. Cl. 56—13.3 **4 Claims**



1. A lawn mower comprising a frame supported on wheels for movement over the ground, an elongated slotted cutter bar mounted on said frame extending horizontally in a position close to the ground when said frame is supported on said ground by said wheels as aforesaid, an endless cutting band, means on said frame for guiding said cutting band for movement across the slots of said cutter bar to cut grass projecting through said slots, drive means for moving said band continuously in one direction, said guide means including a hold-down member for holding said cutting band down against the top surface of said cutter bar, spring means for pressing down resiliently on said hold-down member, said slots in said cutter bar being formed between forwardly projecting teeth along the front edge of said cutter bar, said band having forwardly projecting cutting elements which pass over said slots, and said hold-down member having forwardly projecting fingers above said cutting elements and in register with said cutter bar teeth.

4,044,535

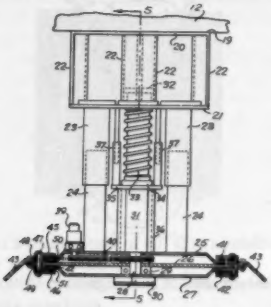
NON-SOIL PENETRATING HARVESTING BLADE FOR SUGAR CANE

Victor M. Alexandrino, Box 882, Fajardo, P.R. 00648

Filed Dec. 19, 1975, Ser. No. 642,548
Int. Cl.[2] A01D 35/12
U.S. Cl. 56—15.8 **15 Claims**

1. A harvesting cutter assembly comprising a tractor tool bar, generally horizontally extending housing means below the tool bar, a rotary cutter blade supporting disc journalled in said

housing means with its peripheral portion extending outwardly from said housing means, cutting blade means on said peripheral portion, means to yieldably connect said housing means to the tractor tool bar and including means biasing said housing means downwardly, and ground-engaging skid means positioned underneath said supporting disc and on the bottom of said housing means and acting to limit the position of said cutting blade means to a substantially constant height above ground level while preventing said cutting blade means from penetrating the soil.

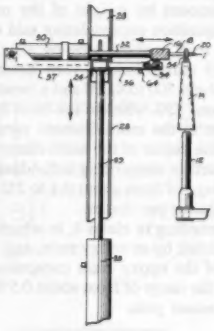


4,044,536

APPARATUS AND METHOD FOR REMOVING BOBBINS ON SPINNING MACHINES

James D. Stone, 412 Rockmont Road, Greenville, S.C. 29607

Filed Jan. 21, 1976, Ser. No. 651,130
Int. Cl.[2] D01H *9/04*
U.S. Cl. 57—52 **10 Claims**



1. A bobbin removal apparatus wherein bobbin members arranged over spindle members on a spinning frame are to be engaged and moved from one location to another comprising:

a movable bobbin engagement means for engaging and removing said bobbins from said spindles;

a support assembly carrying said bobbin engagement means for movement in a vertical and a horizontal direction;

a bobbin adapter member carried on an upper end of each bobbin having a loop projection swivelably carried by said adapter member;

said loop projection having a central eye portion defined by an interior surface thereof for receiving said engagement means therethrough;

power means for moving said bobbin engagment means in said vertical and horizontal directions along with said support assembly into linear alignment with said eye portion of said loop projection and for engagement therewith;

said engagement means including a complimentary means for turning said loop projection to automatically align said eye portion with said engagement means for connection with said engagement means; and

said bobbin engagement means being further movable by said power means to lift and remove said bobbin from said spindle and spinning frame.

8. The method of removing a plurality of bobbins arranged over spindles on a spinning frame by automatically engaging said bobbins for removal therefrom comprising:

a. providing a movable bobbin engagement means having a plurality of engaging elements for engaging said bobbins;

b. providing an automatically aligning adapter member carried adjacent the top of each said bobbin having a projection means with an engagement portion for receiving said bobbin engagement means;

c. moving said engagement means into linear alignment with said adapter members;

d. providing complimentary end portions on said engaging elements to initially engage said projection means of said adapter member;

e. automatically turning an aligning said engagement portion with said engagement elements for providing a connecting relationship therebetween regardless of the orientation of said bobbin on said spindle; and

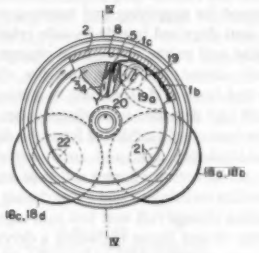
f. moving said engagement means to remove said bobbins from said spindles.

4,044,537

SPINNING METHOD AND APPARATUS THEREFOR

Eizaburo Negishi, Yono, and Masanori Negishi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Negishi Kobyo Kenkyusho, Japan

Filed Nov. 18, 1975, Ser. No. 633,004
Claims priority, application Japan, Nov. 29, 1974, 49-138194
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 **4 Claims**



1. An open-end spinning method for forming a yarn comprising the steps of:

projecting sliver fibers radially outwardly onto the inner surface of an outer rotor so as to form a sliver;

disposing an inner rotor concentrically within said outer rotor;

providing said inner rotor with a spinning passage, disposed along a radial line and within a radial plane, which is provided with an inlet disposed toward said inner surface of said outer rotor and an outlet disposed along the axis of said inner rotor;

conducting said sliver radially inwardly into said spinning passage of said inner rotor and discharging said sliver through said outlet;

rotating said inner and outer rotors at revolution rates having a predetermined revolution differential defined therebetween,

whereby said sliver is twisted and subjected to a predetermined amount of tension; and

during the spinning operation, pressing the sliver formed along the inner surface of the outer rotor onto said inner surface by means of at least one centrifugal disk means provided between the inner and outer rotors at a position

adjacent the inlet end of the spinning passage of the inner rotor,

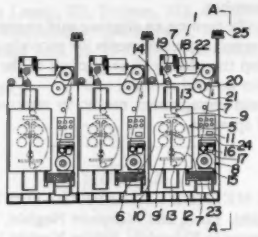
said centrifugal disk being made to revolve concentrically together with the inner rotor and within the outer rotor and to carry-out self-rotation by press-friction with the sliver which results from said disk being moved centrifugally outward toward said sliver and said outer rotor.

4,044,538

ARRANGEMENT OF STRAND TWISTING APPARATUSES

Itsuo Hoshide, Iwakuni, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Jan. 24, 1977, Ser. No. 762,123
Int. Cl.² D07B 3/00
U.S. Cl. 57—62 **3 Claims**



1. Arrangement of strand twisting apparatuses, comprising a plurality of strand twisting apparatuses which are side-by-side and vertically installed in a row on floor, and each of which comprises a fore portion of a frame including a flyer unit vertically disposed for supplying and twisting strands into a cable, a take-up unit disposed in side-by-side relation with said flyer unit to wind said cable, a direction change roll unit disposed immediately above said flyer unit for changing said cable vertically fed from said flyer unit to a horizontal direction, a capstan roll unit disposed immediately above said take-up unit for smooth feed of said cable fed from the direction change roll unit to said take-up unit, and an over-twister unit disposed between said direction change roll unit and said capstan roll unit to stabilize twisting of said cable during travelling between said direction change roll unit and said capstan roll unit; and a rear portion of said frame including a driving unit for driving said flyer unit, said take-up unit, said direction change roll unit, said capstan roll unit and said over-twister unit.

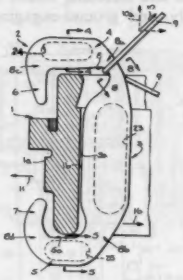
4,044,539

AERODYNAMIC RING TRAVELERS FOR YARN TWISTERS

Robert L. Goerens, Esch sur Alzette, Luxembourg, assignor to Uniroyal Luxembourg S.A., Steinfort, Luxembourg

Filed Dec. 15, 1976, Ser. No. 750,795
Claims priority, application Germany, Dec. 23, 1975, 2558428
Int. Cl.² D01H 7/60
U.S. Cl. 57—125 **33 Claims**

1. In a ring traveler designed for movement in only one given direction along a ring of a yarn twister or like machine, which traveler (a) has streamlined cross-sectional contours as well as respective guide surfaces for sliding contact with the ring and for guiding the yarn to the spindle and (b) is provided, in a section thereof which lies at the inside face of the ring when the traveler is mounted thereon, with a generally airfoil-like cross-sectional configuration such that when the traveler is in motion aerodynamic lift forces are generated at said section which are directed toward the middle of the ring; the improvement which comprises a construction of said section of the traveler to define in said section and within the confines of said airfoil-like cross-sectional configuration thereof at least one hollow space, thereby to provide the traveler at said section



with a maximized ratio of the magnitude of its outer surface to its weight.

4,044,540

ELASTOMER COATED CARBON FILAMENT REINFORCING YARN OR CORD, METHOD AND ARTICLE

Masamichi Toki; Noriaki Kusatsu; Yoshio Kohno, all of Okazaki, and Kenji Matsugasako, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,859
Int. Cl.² D02G 3/36, 3/40, 3/48
U.S. Cl. 57—153 **13 Claims**

1. A multi-filament reinforcing carbon yarn having tenacity of at least about 7 grams per denier, said reinforcing yarn being encapsulated by a resorcinol-formaldehyde-latex composition, in which the amount by weight of the resorcinol-formaldehyde-latex composition encapsulating said multi-filament yarn is equivalent at least to about 10% by weight of the multi-filament yarn, said multi-filament yarn having a denier in the range of from about 500 to 4,000 and a twist factor in the range of from 0 to about 250, wherein the twist factor is the twist in turns per 10 cm in the multi-filament yarn multiplied by the square root of the denier of the multi-filament yarn, said multi-filament yarn further comprising individual filaments having a denier in the range of from about 0.4 to 2.0 and a tenacity of at least about 10 grams per denier.

2. A yarn according to claim **1**, in which the multi-filament yarn is encapsulated by an epoxy resin, and in which the equivalent amount of the epoxy resin encapsulating the multi-filament yarn is in the range of from about 0.5% to 10% by weight of the multi-filament yarn.

4,044,541

PROCESS FOR PRODUCING TEXTURED POLYESTER MULTIFILAMENT YARN

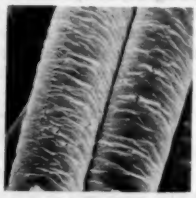
Morio Ikeda, Matsuyama, Japan, assignor to Teijin Limited, Osaka, Japan

Filed Apr. 10, 1975, Ser. No. 566,758
Claims priority, application Japan, Apr. 15, 1974, 49-40897
Int. Cl.² D02G 1/02
U.S. Cl. 57—157 TS **8 Claims**

1. A process for producing textured polyester multifilament yarn comprising the steps of:

providing a feed yarn consisting of a plurality of synthetic linear ethylene terephthalate polymer filaments having a birefringence value of at most 0.04, by melt-spinning said linear polyester to form an undrawn multifilament yarn, winding up said undrawn multifilament yarn at a speed of 2750 m/min or lower and, applying to said undrawn multifilament yarn, a finishing agent not capable of diffusing into the inside of said filaments but capable of preventing formation of protuberances at a surface protuberance

number larger than 5, on the surface of said filaments when the resultant feed yarn is twisted at a twist number of 32500/D turns/m, wherein D represents a denier of said feed yarn, without drawing the yarn after aging the



feed yarn at a temperature of 40° C at a relative humidity of 70% for 21 days, and;

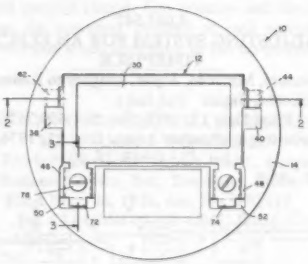
subjecting said feed yarn to a simultaneous or sequential draw-twisting operation.

4,044,542

WATCH MODULE CONSTRUCTION

Roger A. Burke, Laguna Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 1, 1976, Ser. No. 691,815
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R **4 Claims**



1. A digital watch module comprising:

a top spacer having a pocket therein for receipt of a digital display device and electrical contacts in said pocket for making contact with a display device in said pocket, said pocket having a bottom to serve as a limiting position of a display device in said pocket;

a digital display device sized to fit within said pocket and being positioned within said pocket and resting on said bottom;

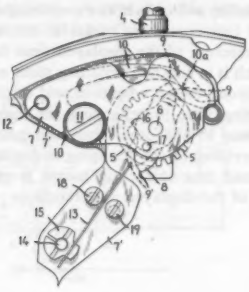
a spring frame engaging over said display device and engaging in said top spacer for resiliently restraining said display device and retaining it in said pocket, said spring frame having first and second spring fingers thereon respectively engaging in first and second spring-finger recesses in said top spacer, said spring fingers being resiliently deflected to urge said spring frame downwardly on the said display device, said spring frame further having first and second tangs thereon and a screw through each of said tangs and into said top spacer for retaining said spring frame with a respect to said top spacer.

4,044,543

SWITCHING MECHANISM OF AN ELECTRONIC WRIST WATCH

Yukio Ikehata; Nobuo Ohara; Yasuhiro Kawanishi; Shigeyuki Masuda; Isamu Nishida, and Hideyuki Nakao, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 28, 1976, Ser. No. 755,071
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R **3 Claims**



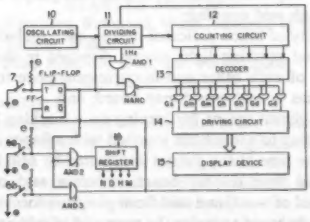
1. A switching mechanism of an electronic wristwatch comprising a rotatable winding stem, a clutch wheel rotatable with but axially movable on said stem, a winding pinion rotatable on said stem adjacent said clutch wheel, said winding pinion and clutch wheel having on adjacent ends rectangular teeth engageable with one another to couple said winding pinion to said winding stem, a transmission gear wheel rotatable about an axis perpendicular to the axis of said winding stem and meshing with said winding pinion, a rotatable cam coaxial with and adjacent to said transmission gear wheel, lost-motion connecting means coupling said cam with said transmission gear wheel, spring means cooperating with said cam means to restrain rotation of said cam by rotation of said transmission gear wheel until one end of travel of said lost-motion connecting means is reached and then advancing said cam until the other end of said lost-motion connection is reached, and a switching spring engageable by said cam for flexing said switching spring into engagement with a contact connected with watch circuitry to perform a switching function.

4,044,544

ELECTRONIC TIMEPIECE

Kenjiro Yagi, Tokyo, and Kazuhiro Asano, Chiba, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 29, 1976, Ser. No. 653,621
Claims priority, application Japan, Feb. 5, 1975, 50-15134
Int. Cl.² G04B *27/08*; G04C *3/00*
U.S. Cl. 58—23 R **6 Claims**



1. In an electronic timepiece of the type having an oscillator for generating a high frequency signal suitable as a time standard; circuit means including a multi-stage dividing circuit connected to receive signal for dividing it to a lower frequency

time signal representative of a predetermined time function; display means responsive to the time signal for displaying in a normal display mode the time function represented thereby; and time-correcting means including a manually operable switch coacting with said circuit means for effecting correction of the displayed time function in response to operation of said switch, the improvement comprising: means including a manually operable safety switch for enabling said time-correcting means to effect a correction of the displayed time function when said safety switch is in one switching state and for disenabling said time-correcting means to render it ineffective to make a correction of the displayed time function when said safety switch is in another switching state; and means coacting with said circuit means whenever said safety switch is in said one switching state for changing the display mode of said display means to one other than said normal display mode thereby providing by the changing in display mode an indication that said time-correcting means is enabled to effect a correction of the displayed time function.

4,044,545

WORLD CLOCK

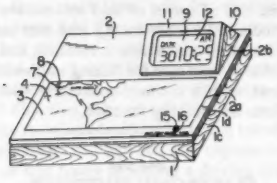
Teruo Shimizu, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 1, 1975, Ser. No. 636,641

Claims priority, application Japan, Dec. 11, 1974, 49-150513[U]; Dec. 11, 1974, 49-150514[U]; Dec. 11, 1974, 49-150515[U]; Dec. 13, 1974, 49-151901[U]; Dec. 13, 1974, 49-151902[U]; Dec. 13, 1974, 49-151903[U]; Dec. 13, 1974, 49-151904[U]

Int. Cl.² G04B *19/22, 19/24, 19/02*

U.S. Cl. 58—42.5 **5 Claims**



1. A world clock comprising:

a cabinet including an open box and a front plaque having a central opening for exposing a world map;

a time display means including a time display board mounted above the upper surface of said front plaque;

a world map board attached to said front plaque and exposed through said opening;

a plurality of touch indicator means, each including a touch pin and marking light source disposed in the neighborhood of each other and in correspondence to respective districts in said world map board; and

display circuit means for turning on a marking light corresponding to a touch pin touched with a finger and displaying the time at the district designated by said touched pin in said time display board, wherein said open box is formed of wood and said front plaque is formed of a metal plate disposed to cover the open end of said open box, and further comprising a metal bottom plate disposed on the outer surface of the bottom plate of said box and fastening means penetrating through said metal bottom plate and the bottom plate of said box for attaching electric parts contained in said box.

4,044,546

DIGITAL LIQUID CRYSTAL ELECTRONIC TIMEPIECE WITH COLOR CODED DISPLAY

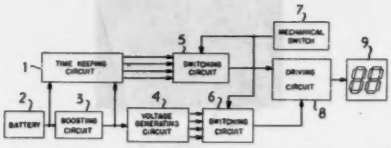
Mitsuo Koike, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 10, 1976, Ser. No. 713,227

Claims priority, application Japan, Aug. 11, 1975, 50-97387

Int. Cl.² G04B *19/34*

U.S. Cl. 58—50 R **6 Claims**



1. An electronic timepiece with a digital liquid crystal display, comprising a time signal pulse generating circuit, a time counting circuit for generating time signals corresponding to seconds, minutes, hours and dates, liquid crystal display means having retardation effect for displaying a digital time signal in different colors according to the drive voltage applied, a first switching circuit means for selectively supplying different time signals from said time counting circuit to said display means for visual display thereby, a voltage generating circuit for generating a plurality of different drive voltages for driving said liquid cyrstal display means, and a second switching circuit means coordinated with said first switching circuit means to supply from said voltage generating circuit to said liquid crystal display means a selected drive voltage corresponding to the selected time signal to be displayed, whereby different time signals are distinguished from one another by being displayed in different colors.

4,044,547

TIME ADJUSTING SYSTEM FOR AN ELECTRONIC TIMEPIECE

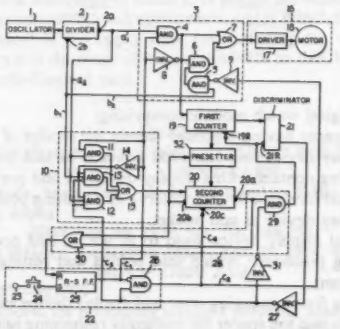
Yasuo Kusumoto, Matsudo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 11, 1975, Ser. No. 639,767

Claims priority, application Japan, Dec. 11, 1974, 49-142098

Int. Cl.² G04B *27/00*

U.S. Cl. 58—85.5 **1 Claim**



1. A time adjusting system for an electronic timepiece comprising: an oscillator circuit for generating high frequency pulses; a dividing circuit connected to said oscillator circuit for dividing the high frequency pulses therefrom into 1 HZ pulses for use as time standard pulses and higher frequency pulses higher in frequency than 1 HZ for use as time adjusting pulses; a time-measuring device for measuring time in response to the 1 HZ pulses; a first counter for selectively counting 30 1 HZ

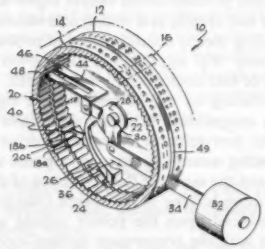
pulses from said dividing circuit and providing a corresponding count signal; a discriminating circuit for discriminating between an advanced signal appearing during the first 30 seconds of 1 minute and a delayed signal appearing during the latter 30 seconds of the 1 minute in response to the count signal provided by said first counter; a second counter comprising an up-down 30-counter for counting 1 HZ pulses when counting in an up-counting mode; a first gate circuit connected to said dividing circuit to receive therefrom the 1 HZ pulses and the higher frequency pulses operative to selectively apply them to said time-measuring device and operative to selectively apply the 1 HZ pulses to said first counter; a second gate circuit connected to said dividing circuit to receive therefrom the 1 HZ pulses and the higher frequency pulse and operative to selectively apply them to said second counter; a manually operable switch operable to initiate the time adjustment; control circuit means responsive to operation of said switch for generating a control signal and applying it to said first gate circuit which responds thereto to stop the supply of 1 HZ pulses and higher frequency pulses to said time-measuring device and to stop the supply of the 1 HZ pulses to said first counter, and applying the control signal to said second gate circuit which responds thereto to supply 1 HZ pulses to said second counter and for changing the operation of said second counter to the down-counting mode when said advanced signal is generated from said discriminating circuit, and applying the control signal to said first gate circuit and second gate circuit which respond thereto to supply the higher frequency pulses to said time-measuring device and second counter when said delayed signal is generated from said discriminating circuit; a pre-setting circuit for presetting the counting content of said first counter in said second counter when operating in the down-counting mode when the counting content reaches 0-second in response to the control signal; and a resetting circuit for resetting said control circuit when the counting content of said second counter reaches 0-second when operating in the down-counting mode in response to the control signal, and for resetting said control circuit, first counter and discriminating circuit when the counting content of said second counter reaches 30-seconds when operating in the up-counting mode.

4,044,548

TIME INDICATING APPARATUS AND TRANSMISSION MECHANISM THEREFOR

Francis W. Rowbottam, Santa Barbara, Calif., assignor to New England Business Service, Inc., Townsend, Mass.

Filed Mar. 26, 1976, Ser. No. 670,619
Int. Cl.[2] G04B 19/02; G06C 15/26
U.S. Cl. 58—125 C **11 Claims**



1. A timing device comprising:

a minute wheel having 60 numbers 0 through 59 formed thereon;

an hour wheel having a portion forming the numbers 1 through 12 repeated five times so that there are 60 numbers thereon; and

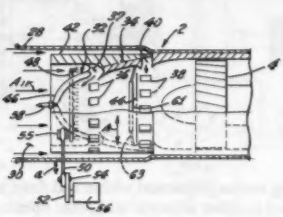
means for rotating said wheels about a predetermined axis, said means rotating said minute wheel by one-sixtieth turn every minute, and rotating said hour wheel by one-sixtieth turn after each complete rotation of said minute wheel.

4,044,549

LOW EMISSION COMBUSTION PROCESS AND APPARATUS

Eugene B. Zwick, 16841 Edgewater Lane, Huntington Beach, Calif. 92647

Continuation of Ser. No. 313,681, Dec. 11, 1972, abandoned. This application Nov. 5, 1975, Ser. No. 629,071
Int. Cl.[2] F02C 9/14
U.S. Cl. 60—39.02 **27 Claims**



1. A combustion process for producing exhaust gases having a low content of carbon monoxide and nitrogen oxides, said process comprising:

introducing a mixture of hydrocarbon fuel and air into a combustion zone having a volume which is sufficient to support stable combustion under the desired combustion conditions, with the mixture being premixed to a sufficient extent to provide a substantially uniform and homogeneous mixture within the combustion zone;

igniting and burning the mixture within the combustion zone;

maintaining the combustion temperature at about 3000° F. or less to reduce the content of nitrogen oxides in the exhaust gases to a level of about 1.5 grams or less for each kilogram of consumed fuel;

controlling the fuel-to-air ratio in the combustion zone at lean fuel-to-air ratios of about 0.0035 to about 0.035 under stable combustion conditions which exceed lean blowout to a sufficient extent to reduce the carbon monoxide levels in the exhaust gases to about 12.0 grams or less per kilogram of consumed fuel, and

maintaining the flow rate of the fuel-air mixture into the combustion zone at a level which exceeds the turbulent flame velocity within the combustion zone to prevent flashback to the point of introduction of the combustible mixture.

4,044,550

TURBINE WHEEL CONTAINMENT SHROUD FOR A PNEUMATICALLY POWERED TURBINE ENGINE STARTER MOTOR

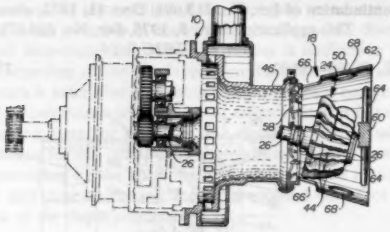
Michael Lee Vermilye, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 10, 1975, Ser. No. 612,205
Int. Cl.[2] F02C 7/26, 7/32
U.S. Cl. 60—39.09 R **8 Claims**

1. A containment shroud for affixation to the exhaust duct of a fluid powered starter motor for a turbine engine, said exhaust duct including an exhaust outlet having an axis and a generally circular opening oriented transversely to said axis, said motor having a turbine wheel mounted within said motor for rotation about an axis substantially coaxial with the axis of said exhaust outlet, said shroud comprising:

an annularly shaped member, said member being adapted to be positioned adjacent to and to extend outwardly from the opening of said exhaust outlet, said member having an axis adapted to be oriented substantially coaxially with the

axis of said exhaust outlet, said member having at least one aperture opening radially outwardly adjacent the opening of said exhaust outlet for relieveing fluid pressure from within said member and said exhaust outlet, the outer end of said member terminating in and defining an outer opening spaced outwardly from the opening of said exhaust outlet when said member is positioned adjacent said exhaust outlet, and



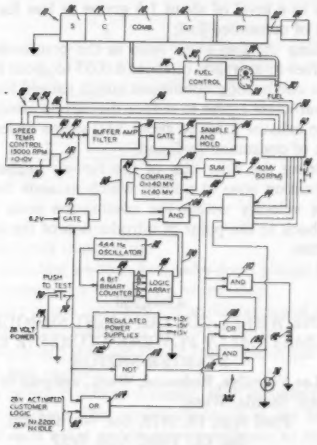
blocking means positioned within and fixed to said annularly shaped member adjacent said outer opening, said blocking means being so oriented and constructed as to permit substantial fluid flow through said outer opening and to prevent egress of said turbine wheel from said outer opening.

4,044,551

STAGNATION SENSING CONTROL

Robert E. Nelson, Indianapolis, and Keith A. Pieper, Brownsburg, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1976, Ser. No. 681,782
Int. Cl.[2] F02C *7/26*
U.S. Cl. 60—39.14 **5 Claims**



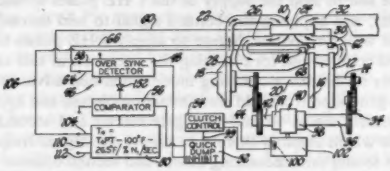
1. An engine speed stagnation control system for a gas turbine engine having a starter motor and fuel supply means under the control of rely switch means and wherein the gas turbine engine includes a combustor, compressor and power turbine; the control system comprising: means for sensing engine speed and producing an output signal directly in response thereto, means including signal responsive gate means to sample said output signal and to maintain a first control speed signal, means for adding a fixed increment control signal to said first control speed signal to produce a reference signal of desired speed increase, time delay means for controlling said gate means to maintain said reference signal for a perdetermined time delay period, signal generating means including comparator means for comparing said reference signal and said engine speed signal and operative following the predetermined time period to produce a relay control signal, and logic means responsive to said relay control signal for controlling starter energization and fuel supply to the combustor to maintain engine start when the engine speed has increased an amount equal to the desired speed increase during the elapsed time period established by said time delay means and to terminate engine start when the engine speed increase is below the desired speed increase.

4,044,552

GAS TURBINE ENGINE SYNCHRONOUS SPEED DETECTOR

Gene A. West, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 19, 1976, Ser. No. 706,495
Int. Cl.[2] F02C *3/10*
U.S. Cl. 60—39.16 S **3 Claims**



1. In a gas turbine power plant having a gas generator including a compressor, combustion apparatus, a compressor drive turbine and a power turbine coupled to the gas generator and torque transmitting means including a selectively energized clutch for coupling the compressor drive turbine and power turbine to regulate the amount of power transfer therebetween and wherein the combustion apparatus temperature is characterized by falling abruptly when the power turbine and compressor drive turbine are operated at synchronous speed the improvement comprising: means for unloading said clutch to prevent power transfer from the power turbine to the compressor drive turbine capable of producing compressor surge, means for generating first and second signals corresponding to power turbine speed and compressor drive turbine speed, respectively, oversynchronous speed detector means for comparing said first and second signals including means to produce a first predetermined output signal, quick dump inhibit means having an input responsive to said first predetermined output signal and an output signal for controlling said selectively energized clutch, said quick dump inhibit means being responsive to said first predetermined output signal to prevent quick unloading of said clutch, said oversynchronous speed detector means including means conditionable to produce an oversynchronous speed trip signal when the power turbine speed exceeds that of said compressor turbine speed, means for sensing and producing an engine temperature signal, means for producing a temperature schedule signal and a signal in response to the derivative of compressor drive turbine speed, signal generating means operative in response to said temperature signals and the signal of the derivative of the speed of said compressor drive turbine at the abrupt change in engine temperature produced upon the power turbine speed becoming synchronous with the compressor turbine speed to produce a temperature drop output signal in response to synchronous speed operation of the compressor turbine and the power turbine, comparator means responsive to the temperature drop output signal to condition said oversynchronous speed detector means to maintain said first predetermined output signal as the speed of said compressor drive turbine approaches and becomes synchronous with the speed of said power turbine, said signal generator means and comparator means being responsive to an increase in engine temperature subsequent to the abrupt temperature fall at synchronous speed operation of the

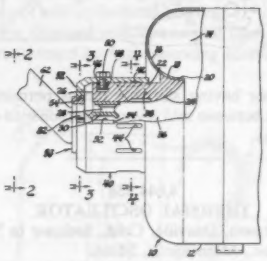
power turbine and compressor drive turbine to condition said oversynchronous speed detector means to produce an oversynchronous speed trip signal for conditioning said quick dump inhibit means to produce a quick dump of said clutch thereby to prevent load transfer from said power turbine to the compressor drive turbine.

4,044,553

VARIABLE GEOMETRY SWIRLER

John M. Vaught, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,310
Int. Cl.² F02C 9/14
U.S. Cl. 60—39.23 **2 Claims**



1. A variable swirler assembly for controlling air swirl into the inlet of a combustor having fuel supplied thereto by a pump operative in accordance with turbine engine operation comprising an open ended tubular member having one end thereof for connection to the inlet of a combustor, said tubular member having a wall with a plurality of inflow passages therethrough to direct an air swirl into the combustor inlet, a variable geometry element supported on the outer periphery of said tubular member in overlying relationship with said inflow passages to control air flow therethrough, a nozzle directed through the opposite end of said tubular member including an inboard peripheral surface and an outboard stem portion, an actuator supported on said nozzle between said inboard peripheral surface and said outboard stem portion, said actuator including a first wall portion fixedly secured to said stem, a second movable portion on said actuator, means for connecting said movable wall portion to said sleeve for rotating it with respect to said inflow passages, said nozzle having a fuel passage therein, said pump increasing fuel flow through said passage in accordance with engine operation, means forming a variable volume chamber in said actuator including a port for receiving fuel from said fuel passage to produce relative movement between said first portion and said movable portion to shift said variable geometry element with respect to said inflow passages to produce an incresed amount of air swirl into said inlet in accordance with increases in fuel flow through said nozzle thereby to improve mixture of air and increasing quantities of fuel flow to the combustor during engine operation.

4,044,554

GAS TURBINE ENGINE FUEL CONTROL

Gene A. West, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

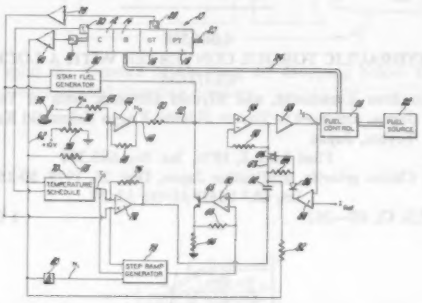
Filed July 19, 1976, Ser. No. 706,512
Int. Cl.² F02C 9/08
U.S. Cl. 60—39.28 T **4 Claims**

1. In a fuel control system for a gas turbine engine having means for generating a turbine inlet temperature signal, means for generating a turbine speed signal, and means for controlling fuel flow to the engine in response to a fuel control signal; means for producing said fuel control signal comprising

a speed governing circuit having a throttle signal input requesting a certain turbine speed,

means comparing the throttle signal with the turbine speed signal to produce a speed error signal,

a compensation loop having a differentiating circuit responsive to a rapid increase in the speed error signal for subtracting a variable compensation signal from the speed error signal to produce the fuel control signal which therefore is constrained in its rate of increase, the compensation loop including a step ramp generator programmed according to the temperature signal for offsetting at least a portion of the compensation signal to limit the response of the compensation signal to high change rates of the speed error signal, thereby allowing moderate increases in the speed error signal to be immediately reflected in the



fuel control signal, the step ramp generator further gradually decreasing the compensation signal to allow an increasing fuel control signal following the rapid increase in the speed error signal,

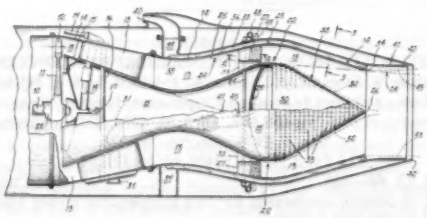
and engine temperature limiting means including means for establishing an engine temperature limit schedule to provide a schedule signal, comparator means for comparing the turbine temperature signal and the schedule signal to produce a temperature error signal, the compensation loop including integrator means responsive to the temperature error signal to vary the compensation signal to reduce the fuel control signal when turbine temperature exceeds the temperature schedule.

4,044,555

REAR SECTION OF JET POWER PLANT INSTALLATIONS

William G. McLoughlin; Arnold V. Pilling; John Reardon, and William E. Addison, all of Birmingham, Ala., assignors to Hayes International Corporation, Birmingham, Ala.

Filed Sept. 30, 1958, Ser. No. 765,700
Int. Cl.² F02K 3/04
U.S. Cl. 60—264 **7 Claims**



1. In a gas turbine engine having blades and an exhaust tailpipe, the combination of an exhaust cone axially mounted within the tailpipe and having its rearward end adjacent to discharge opening of the exhaust pipe with substantially all of the externally viewable surfaces of said exhaust cone formed or porous stainless steel material, means to supply cooling air to

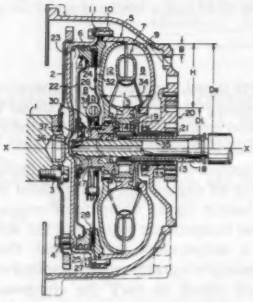
the interior of the cone for venting thereof through said porous material, a hollow strut member of airfoil configuration spanning the annular gas passageway between the exhaust tailpipe and the said cone with substantially all of the externally viewable surfaces of said strut member formed of stainless steel material, means to supply cooling air to the interior of said hollow strut member, means to pass cooling air in heat interchange relation with the outer surface of substantially all parts of the exhaust tailpipe whose related inner surface is externally viewable, and a constriction in the exhaust tailpipe located downstream of the hot parts of the engine and serving with the exhaust cone to conceal the hot parts of the engine from external view, whereby the detectible infrared emission of the engine is substantially reduced.

4,044,556

HYDRAULIC TORQUE CONVERTER WITH A LOCK-UP CLUTCH

Koujirou Kuramochi, and Kiyoshi Ohnuma, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 5, 1976, Ser. No. 683,284
Claims priority, application Japan, Dec. 26, 1975, 50-157478
Int. Cl.² F16D *33/00, 33/20*
U.S. Cl. 60—361 **1 Claim**



1. A hydraulic torque converter comprising an input member including an impeller, an output member including a turbine, a reaction member including a stator, and a lock-up clutch adapted to mechanically connect said input member with said output member, wherein the improvement comprises that a torus formed by said impeller, said turbine and said stator is so dimensioned that a ratio of its axial length L to its radial height H (L/H) is substantially from 0.64 to 0.80, the ratio of its inner diameter D_i to its diameter D_o (D_i/D_o) is substantially from 0.40 to 0.33, and the ratio of an annular flow passage area *a* at the exit of the impeller to a circular area A defined by the torus outer diameter is substantially from 0.18 to 0.23.

4,044,557

FEED ROLLS HAVING AUTOMATIC SPEED CONTROL

Herman V. Stoessel, and Daniel R. Prichard, both of Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 678,499, April 20, 1976. This application Dec. 9, 1976, Ser. No. 749,175
Int. Cl.² F15B *18/00;* F16H *39/46;* G01M *1/168*
U.S. Cl. 60—420 **11 Claims**

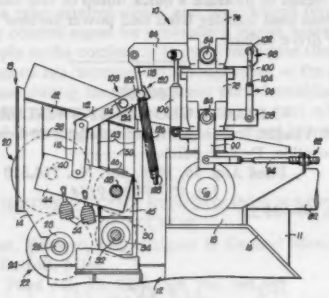
1. A control mechanism for two independent power trains, said mechanism including:

a first speed regulator associated with one of said power trains and having a first control lever;

a second speed regulator associated with the other of said power trains and having a second control lever;

a connector operably coupling said levers for in unison movement thereof to control said power trains simultaneously; and

a linkage associated with said first lever for independent control of said one power train,



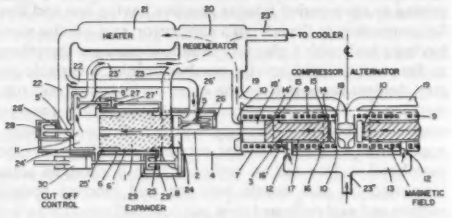
said connector having shiftable means permitting relative movement between said levers in response to operation of said linkage.

4,044,558

THERMAL OSCILLATOR

Glendon M. Benson, Danville, Calif., assignor to New Process Industries, Inc., Minneapolis, Minn.

Division of Ser. No. 496,229, Aug. 9, 1974, Pat. No. 3,928,974. This application Sept. 10, 1975, Ser. No. 611,933
Int. Cl.² F02G *1/04*
U.S. Cl. 60—520 **92 Claims**



1. A thermal machine which functions as a damped resonant positive displacement mechanical oscillator comprising:

heat exchange means including at least one thermal source and at least one thermal sink;

a working fluid adapted to flow through the heat exchange means including the thermal source and the thermal sink; and

at least two positive displacement elements that oscillate out of phase with one another and in resonance in combination with one another interposed in the working fluid and adapted to subject the working fluid to a thermodynamic cycle.

4,044,559

ROTARY CLOSED SERIES CYCLE ENGINE SYSTEM

Donald A. Kelly, 58-06 69th Place, Maspeth, N.Y. 11378

Filed Dec. 11, 1973, Ser. No. 423,777
Int. Cl.² F02G *1/04*
U.S. Cl. 60—525 **1 Claim**

1. A rotary closed series cycle engine comprising multiple indentical rotary units consisting of rotors and vanes revolving within cylindrical housings,

two identical end plates secured to the ends of said cylindrical housings including concentric circular grooves uniformly disposed on the inside faces of said end plates,

a uniformly slotted rotor eccentrically and tangentially disposed within said cylindrical housing,

multiple flat and hollow rectangular vanes in sliding communication with the slots of said uniformly slotted rotor,

multiple ball bearings secured to each side of said multiple flat and hollow rectangular vanes by means of multiple cylindrical pins, said multiple ball bearings are in rolling contact with said concentric circular grooves uniformly disposed on the inside faces of said end plates,

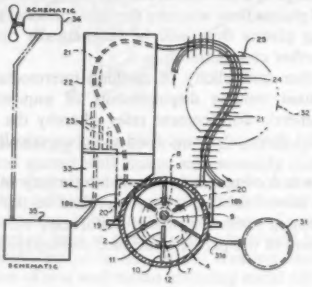
two low-friction discs disposed on either side of said uniformly slotted rotor between said two identical end plates,

a drive shaft concentrically disposed through said uniformly slotted rotor supported by two needle bearings eccentrically disposed within each of said two identical end plates,

multiple gas pressure seals disposed on the outer faces of each of said two identical end plates over said drive shaft,

four outer mounting brackets secured to the outer surface and ends of said cylindrical housing,

four spacers disposed adjacent to said four outer mounting brackets fastened by four mounting screws and nuts,



standard fastening and sealing means utilized for joining and securing components of said rotary closed series cycle engine,

identical gas flow manifolds secured at the sides of said cylindrical housings,

two rectangular ports disposed at the upper sides of said cylindrical housings in direct communication with said gas flow manifolds,

multiple small diameter transfer tubing connected from one lateral group of said gas flow manifolds to the opposite lateral group of gas flow manifolds on adjacent rotary units of said rotary closed series cycle engine,

joining and sealing means for said gas flow manifolds to said cylindrical housings,

joining and sealing means for said multiple small diameter transfer tubing to said gas flow manifolds.

4,044,560

AIR PRESSURE REGULATOR ARRANGEMENT FOR AN INTERNAL COMBUSTION

Heinz Dorsch, Leonberg, and Julius Weber, Grossingersheim, both of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed June 29, 1976, Ser. No. 700,747

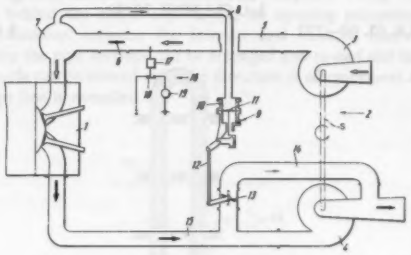
Claims priority, application Germany, July 1, 1975, 2529186

Int. Cl.[2] F02B *23/00, 33/34*

U.S. Cl. 60—601 **12 Claims**

1. An air pressure regulating arrangement for an internal combustion engine which includes a supercharging means for supplying a quantity of charging air to the internal combustion engine, the arrangement comprising:

means operatively associated with the supercharging means for interrupting a supply of fuel to the internal combustion engine upon a pressure of the charging air supplied to the internal combustion engine by the supercharging means reaching a predetermined charging pressure and for restoring a supply of fuel to the internal combustion engine



upon the pressure of charging air dropping below the predetermined charging pressure.

4,044,561

STEAM TURBINE HAVING BEARING STRUCTURES LUBRICATED WITH STEAM CONDENSATE IN RECIRCULATING SYSTEM

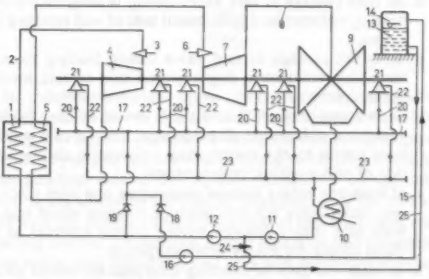
Alfred Hohn, Kirchdorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Aug. 11, 1975, Ser. No. 604,061

Claims priority, application Switzerland, Aug. 6, 1974, 11238/74

Int. Cl.[2] F01B *31/00;* **F01K** *21/00*

U.S. Cl. 60—657 **2 Claims**

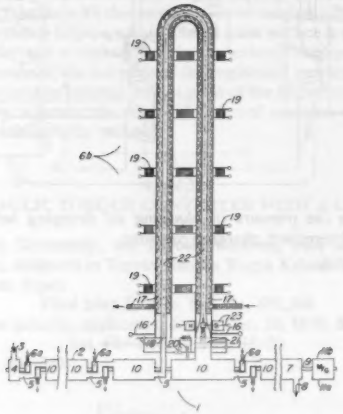


1. A steam turbine comprising a housing within which the turbine rotor is mounted and includes shafting extending through an end wall structure of the housing, bearing means mounted within said end wall structure and which support the shafting, said bearing means having a spheric dome-shaped outer surface adjoining a complementary configured surface provided in said end wall and including pressure pockets facing said shafting, feed-in channels to said adjoining spheric surfaces and to said pressure pockets from a lubrication line, and a lubrication system for supplying said lubricating line with water condensed from the working steam supplied to the turbine, said adjoining surfaces of said bearing means and end wall providing adjustment of said bearing means, and the flow of water between said adjoining surfaces of said bearing means and end wall serving as a seal to prevent loss of steam from said housing.

4,044,562
MULTIROTARY ENERGY CONVERSION VALVE

Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752

Filed May 2, 1974, Ser. No. 466,874
Int. Cl.[2] F01K 27/00
U.S. Cl. 60—721 8 Claims

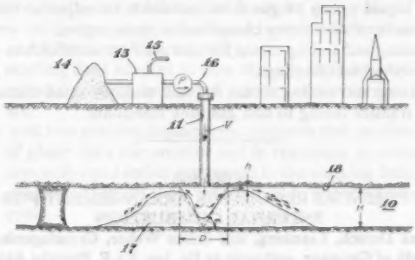


1. A multirotary energy conversion valve for fluids comprising:
   a. a valve casing;
   b. a pair of continuously meshing inlet rotors of constant volume displacements in the meshing irregular peripheries of said rotors rotatably mounted in said valve casing;
   c. a pair of continuously meshing outlet rotors of constant volume displacements in the meshing irregular peripheries of said rotors rotatably mounted in said valve casing; said outlet rotors having torque characteristics and volumetric displacement rates quantitively unequal to the torque characteristics and volumetric displacement rates of said inlet rotors;
   d. an inlet passage in said valve casing leading to the reappearing volumetric displacement side of said meshing inlet rotors;
   e. an outlet passage in said valve casing leading from the vanishing volumetric displacement side of said meshing outlet rotors;
   f. an enclosed channel in said valve casing leading from the vanishing volumetric displacement side of said meshing inlet rotors to the reappearing volumetric displacement side of said meshing outlet rotors;
   g. at least one rotary linkage connecting one inlet rotor and one outlet rotor for synchronous rotation about one axis with said rotary linkage having access external to said valve casing for rotary drive purposes;
   h. at least one pair of meshing intermediate rotors of constant volumetric displacements interposed in said enclosed channel with at least one intermediate rotor connected by said rotary linkage to one inlet rotor and one outlet rotor for synchronous rotation about one axis;
   i. a multiplicity of meshing intermediate rotors of constant volume displacements of sequentially larger volumetric displacement rates with heat exchange means in each divided segment of said enclosed channel whereby a fusionable thermodynamic fluid is diminished in density and increased in temperature under flowing conditions;
   j. at the end of said multiplicity of meshing intermediate rotors with heat exchange means, a fusion means for said enclosed channel comprising:
      1. an enclosed channel with cooled current carrying conductors about the enclosed channel, said current carrying conductors producing a magnetic field in said enclosed channel with the magnetic lines of force being parallel to the centerline of said enclosed channel whereby the ions flowing through said channel and crossing said magnetic lines would be accelerated back toward said centerline of said enclosed channel for "magnetic bottling" means, said enclosed channel being encased in a kinetic and heat energy absorbing means for energy conversion of the fusion products;
      2. an ionization and ion neutralizing means at the ends of said "magnetically bottled" enclosed channel whereby the flowing thermodynamic fusionable fluid is converted to a plasma at the entrance and neutralized at the exit of said enclosed channel;
      3. a multiplicity of magnetic core transformers surrounding said enclosed channel and being electrically synchronized in such a manner as to produce secondary alternating current about the path of flow for resistive heating of said plasma; and
      4. capacitive discharge means connected to the ionization means and ion neutralizing means and the primary of the magnetic core transformers for intermittent discharge of a substantial current along and about the path of plasma flow whereby the unidirectional self contracting plasma flow will be magnetically "pinched" for further contraction;
   k. another multiplicity of meshing intermediate rotors of constant volume displacements of sequentially larger volumetric displacement rates whereby the partially fusioned thermodynamic fluid is volumetrically expanded; and
   l. a power driving means for said multirotary valve whereby said power driving means is utilized to the limit of self sustaining operation of said multirotary valve by the expansion of the partially fusioned thermodynamic fluid.

4,044,563
SUBSIDENCE CONTROL

Robert E. Hurst, and Charles L. Lunsford, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 26, 1973, Ser. No. 326,611
Int. Cl.[2] E21F 15/08
U.S. Cl. 61—35 4 Claims



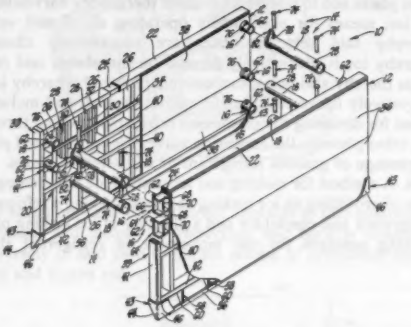
1. In a method of filling a subterranean void by injecting under pressure a carrier liquid, in which solid particles are suspended said particles consisting of a material which in a deposited form is permeable to the flow of said carrier liquid, into said void to form a deposit of solid particles within said void, the improvement which comprises: emplacing a filtercake consisting of a second layer of solids which is substantially impermeable to said carrier liquid on the exposed surface of the deposit then present to render said surface less permeable to said carrier liquid and then continuing said injection of said suspension of solid particles thereby to extend the deposit of said particles through said void.

4,044,564

TRENCH SHORING ASSEMBLY WITH CORNER GUARD ACCESSORY

James L. Griswold, 513 Morningside Drive, Battle Creek, Mich. 49015

Filed Feb. 9, 1976, Ser. No. 656,147
Int. Cl.² E21D 5/00; E02F 9/28
U.S. Cl. 61—41 A 8 Claims



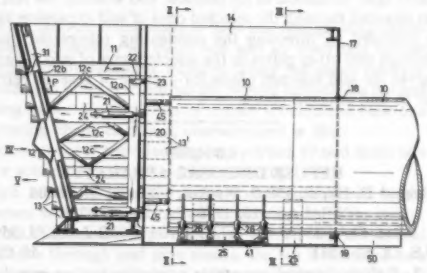
1. A trench shoring assembly of the type including a pair of interconnected spaced wall means, said assembly comprising: wall means having a predetermined thickness and a tapered bottom portion defining a triangularly shaped pointed lower extremity extending between the ends thereof, and guard means disposed at least at one of said ends of said lower extremity for providing protection against abrasion, said tapered bottom portion of said wall means including metal plate means diverging upwardly from said pointed lower extremity, said guard means comprising a triangular member having a triangular front face extending transversely to and between said metal plate means and flanges extending rearwardly from said front face and disposed in lapping relationship with said metal plate means, said guard means being of a higher abrasion resistance than said metal plate means.

4,044,565

APPARATUS FOR AND A METHOD OF LAYING A PIPE LINE

Dieter Stuckmann, Selm, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed May 17, 1976, Ser. No. 687,076
Claims priority, application Germany, May 27, 1975, 2523340
Int. Cl.² E21D 5/12; F16L 1/00
U.S. Cl. 61—41 A 19 Claims



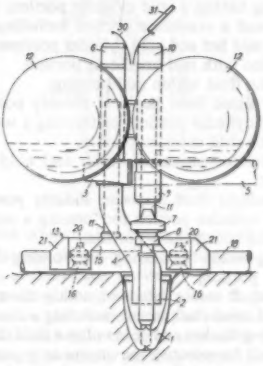
1. An apparatus for use in laying a pipe line composed of pipe sections arranged end-to-end; said apparatus comprising an advanceable shield usable to excavate a trench and to support the walls thereof, the shield having a plurality of elongate members and a frame supporting the members for lonitudinal displacement, an adjustable bulkhead at the front end of the frame which can be adjusted to open a selected portion of the working face to the interior of the shield, and a receptacle for receiving individual pipe sections, the receptacle being disposed behind the shield and having an opening permitting communication between the interior and exterior thereof whereby the pipe sections can be arranged end-to-end and the receptacle can be moved up in the direction of advancement as the pipe line is extended.

4,044,566

MACHINE FOR FORMING TRENCHES FOR PIPELINES OR THE LIKE IN THE SEA BED

Odd Bjørn Biberg, Bronnveien 7, Oslo 2, Norway

Filed Aug. 20, 1975, Ser. No. 606,227
Claims priority, application Norway, Aug. 28, 1974, 743088
Int. Cl.² E02F 5/02; F16L 1/00
U.S. Cl. 61—72.4 5 Claims

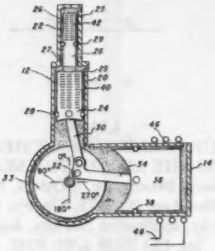


1. In underseas trenching apparatus for forming trenches for pipelines and the like in the sea bed, comprising a releasably-engaging carriage having motive means for releasable engagement on the pipeline and movement along and in an arc around the longitudinal axis of the pipeline, means for driving said motive means along the pipeline by engagement of the motive means with the pipeline, a trenching unit on said apparatus, and projecting beyond the carriage, power means on said apparatus for operating said trenching unit and said means for driving said motive means, said trenching unit and power means comprising a major part of the weight of the apparatus, buoyancy tanks on the apparatus for supporting a major part of the weight of the apparatus, the improvement in which said trenching unit and said power means are integrally-connected to said buoyancy tanks for simultaneous movement therewith, means connecting said carriage to said trenching unit and said power means for causing the same to move along with the carriage on the pipeline and around said pipeline, said means connecting comprising means permitting relative vertical movement between said carriage and said major part of the weight of said apparatus so that a major part of the weight is not imposed on said pipeline, means connecting said bouyancy tanks to each other for altering their bouyancy in relation to the longitudinal axis of the pipeline and said carriage for causing the trenching unit to be adjusted in an arc about the pipeline upon which the carriage is supported and relieving the major part of the weight from off the pipeline.

4,044,567
MODULAR, MAGNETICALLY-COUPLED DRIVE FOR A CRYOGENIC REFRIGERATOR

Robert M. Dix; Samuel F. Tobias, and Stephen L. Whicker, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 2, 1975, Ser. No. 609,850
Int. Cl.² F25B 9/00
U.S. Cl. 62—6 **8 Claims**



1. A Vuilleumier refrigerator comprising
a. a housing having a cold cylinder portion, a hot cylinder portion and a crankcase portion including a cylindrical portion, said hot and cold cylinder portions in open communication with said crankcase portion;
b. a working fluid within said housing;
c. a cold volume fluid displacer slidably positioned within said cold cylinder portion for forming a working volume within the cold cylinder portion;
d. a regenerator mounted within said cold volume fluid displacer;
e. a hot volume fluid displacer slidably positioned within said hot cylinder portion for forming a working volume within the hot cylinder portion;
f. a heating means for heating the working fluid in the hot cylinder portion;
g. a crankshaft means mounted within the crankshaft portion, said crankshaft means including a crankshaft, means connecting the hot and cold volume fluid displacers to the crankshaft for selective movement as to each other, and a cylindrically shaped magnet coupled to rotate the crankshaft, said magnet supported by the crankshaft in the cylindrical portion of the crankcase housing portion; and
h. a modular prime mover means including a housing detachably mounted on the crankcase housing portion, a cylindrically shaped stator, a corresponding cylindrically shaped rotor rotatably mounted in the housing for rotation within the cylindrical motor stator, a cylindrically shaped magnet attached interiorally of the motor rotor for rotation therewith, said cylindrical magnet of the rotor corresponding to the cylindrical portion of the crankcase housing portion housing the cylindrically shaped crankshaft magnet whereby said magnets are locked for rotation.

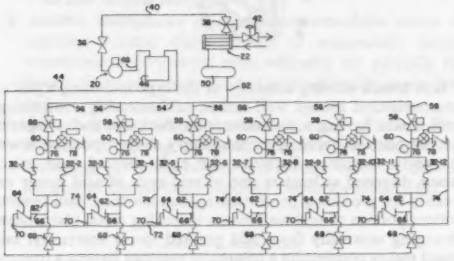
4,044,568
SPACE HEATING AND COOLING SYSTEM

William F. Hagen, Argyle, Tex., assignor to Turbo Refrigerating Company, Denton, Tex.

Filed Dec. 22, 1975, Ser. No. 642,906
Int. Cl.² F25C 5/10
U.S. Cl. 62—73 **19 Claims**

1. In an ice making and harvesting system comprising a refrigerant compressor and condenser, a plurality of ice making plates defining passages for the movement of refrigerant therethrough, means for applying water to said plates for the formation of ice thereon, and a plurality of refrigerant expansion valves communicating with said plates, the improvement comprising additional valves for directing condensed refrigerant from the condenser to the plates without passing through the expansion valves, means for setting the expansion valves for selected ones of said plates for the passage of gaseous refrigerant through said selected plates, at least one of said additional valves being at the same time set for the passage of unexpanded refrigerant through plates other than said selected plates, said means for applying water applying the water only to said selected plates for the formation of ice thereon, the higher temperature of the condensed refrigerant simultaneously passing through said other plates operating to heat said other plates and to release ice formed thereon for harvesting of the ice, means for periodically operating all of said valves whereby said selected plates are successively changed whereby ice is successively formed on the plates, said other plates thereby also being successively changed whereby ice is successively harvested after formation thereof, and including means for directing the condensed refrigerant passing through said other plates to the expansion valves for said selected plates for passage of gaseous refrigerant to said selected plates.

14. A method for making and harvesting ice comprising the steps of providing an ice making apparatus having a refrigerant compressor and condenser and a plurality of ice making plates defining passages for the movement of refrigerant there-



through, providing expansion valves adjacent each of said plates and directing refrigerant through selected ones of said expansion valves, introducing water into contact with those plates having the passages thereof connected to said selected expansion valves for the formation of ice on those plates, providing additional valves between said condenser and said plates, connecting the passage of at least one additional valve to the plates other than those plates connected to said selected expansion valves whereby the higher temperature of the unexpanded refrigerant from the condenser will provide for the release of ice from said other plates, collecting the ice released from said other plates, successively operating said expansion and additional valves for changing their connections with said plates and for thereby forming ice on said other plates after release of ice therefrom and for releasing ice from said selected plates after formation of ice thereon, and wherein the refrigerant directed through the selected ones of said expansion valves is provided by directing the condensing refrigerant passing through said other plates to the selected ones of said expansion valves for said selected plates for passage of gaseous refrigerant to said selected plates.

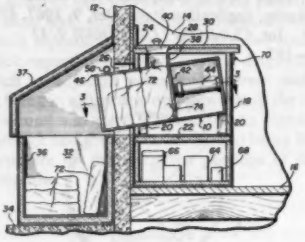
4,044,569
REFUSE DISPOSAL APPARATUS

Richard D. Harza, 150 S. Wacker, Chicago, Ill. 60606

Filed Apr. 15, 1976, Ser. No. 677,221
Int. Cl.² F25C 5/14; B02C 11/08; B30B 1/00, 15/06
U.S. Cl. 62—341 **10 Claims**

1. Refuse disposal apparatus comprising a receptacle for refuse, compressing means, means for operating said compressing means to compact said refuse in said receptacle and to force previously compacted refuse from said receptacle along a predetermined path, means adjacent said receptacle for freezing said refuse as compacted, restraint means adjacent said receptacle for restraining a previously compacted and frozen mass of refuse, said mass serving as a backup means against

which said compressing means compacts refuse, said restraint means comprising a pair of backup members at least partially across said predetermined path and engaged by said mass of



refuse along opposite edges thereof opposite to said compressing means, and means for retracting said backup members transversely of said path to permit release of previously compacted and frozen refuse.

4,044,570

REFRIGERATOR

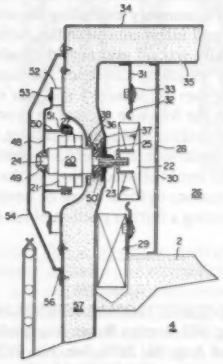
Minoru Ono, Izumi; Sakae Fukuchi, Sano; Syouzou Ogawa, Ohira; Fumio Ishikawa, Utsunomiya, and Shigeo Nagakita, Tochigi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 27, 1976, Ser. No. 652,664

Claims priority, application Japan, Feb. 28, 1975, 50-26655

Int. Cl.² F25D *17/06*; F01D *5/08, 5/18, 25/08*

U.S. Cl. 62—419 **26 Claims**



1. A refrigerator comprising at least one refrigerating chamber means defined by an outer box and an inner box spaced therefrom, foam insulating material filling the space between said outer and inner box, and an air blower including a fan and a driving motor for circlation of cooled air in the at least one refrigerating chamber means, characterized in that:

a recess means is provided in a rear portion of said outer box for accommodating the driving motor;

a pipe means is provided for communicating said recess means with the at least one refrigerating chamber means;

a drive shaft means is provided on the driving motor and extends through said pipe means, the fan is mounted at a forward end of said drive shaft means on a side thereof facing the at least one refrigerating chamber means;

means are provided in said pipe means for guiding the drive shaft means therein to ensure a steady, non-wobbling positioning thereof,

the driving motor includes a main body portion and bracket portions provided at opposite longitudinal sides of said main body portion,

means are provided for mounting said bracket portions at said recess means including:

an adapter plate means mounted at said outer box,

a first rubber seat means mounted at said adapter plate means for accommodating one of said bracket portions,

a second rubber seat means arranged in said pipe means for accommodating the other of the bracket portions of the driving motor and for preventing leakage of cooled air through said pipe means,

a third rubber seat is interposed between opposite ends of said adapter plate means and the outer box means,

and in that means are provided at the outer box for covering the driving motor and the adapter plate means.

4,044,571

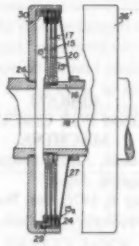
FLEXING-DISK COUPLING

Ernest Wildhaber, 124 Summit Drive, Rochester, N.Y. 14620

Filed June 11, 1976, Ser. No. 695,205

Int. Cl.² F16D *3/78*

U.S. Cl. 64—13 **5 Claims**



1. A flexing-disk coupling for connecting two rotating parts, comprising a plurality of generally circular disks secured to one of said parts at their inner portion,

said disks extending along parallel planes in proximity of each other when the axes of said parts coincide,

the outer ends of said disks being connected to the other of said parts through radially yielding rubber-like layers, to permit said outer ends to relatively expand and contract radially in tilting, whereby each disk transmits only a nearly equal fraction of the total torque transmitted by the coupling,

said disks being of metal to keep them torsionally stiff, whereby to minimize relative angular deflection about the coupling axis,

said layers being confined to the outer end portions of said disks and having a thickness smaller than the average thickness of the working portion of said disks.

4,044,572

SERPENTINE GRID FLEXIBLE COUPLING

Edward J. Wellauer, Wauwatosa, and John A. Strommen, West Allis, both of Wis., assignors to The Falk Corporation, Milwaukee, Wis.

Filed Apr. 9, 1976, Ser. No. 675,324

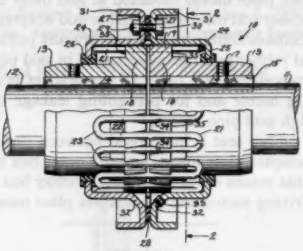
Int. Cl.² F16D *3/52*

U.S. Cl. 64—15 B **2 Claims**

1. In a coupling for connecting driving and driven shafts, which coupling includes a pair of hubs connectable to said shafts for rotation therewith with each hub having a plurality of axially extending teeth which define between them a series of axially directed grooves, the teeth of each hub being so shaped that each groove flares at the face of said teeth which opposes the teeth of the other hub, and a grid interlacing the teeth of both hubs, and including a series of rungs each lying in a groove of each hub, wherein the improvement comprises:

each of said rungs having a circular cross section, and

the bottom of each groove being rounded and being formed



at the narrowest width of the groove as an arc of a circle which mates with said rungs.

4,044,573

CAM MECHANISM FOR CIRCULAR KNITTING MACHINE

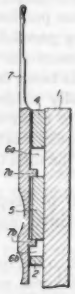
Yosiharu Nakajima, Itami, Japan, assignor to Okuma Machinery Works Ltd., Nagoya, Japan

Filed July 6, 1976, Ser. No. 702,949

Claims priority, application Japan, July 25, 1975, 50-103743[U]

Int. Cl.[2] D04B *15/32*

U.S. Cl. 66—57 **4 Claims**



1. A cam mechanism for a circular knitting machine including stitch cams and double butt needles wherein each of said stitch cams is disposed inside or between a pair of fixed operating butts of each double-butt needle and is provided with main cam wall sections on its under side adapted to control the position of each double-butt needle while causing descending motion thereof after one of its operating butts has come into contact on its upper side with one of said main cam wall sections so that knitting operation is effected thereby, and each of said stitch cams is also provided with auxiliary cam wall sections on its upper side of substantially the same contours as said main cam wall sections for guiding the needle on the under side of the other operating butt to permit smooth movement of said each needle while said one operating butt is being controlled by said main cam wall sections, whereby said main cam wall sections and said auxiliary cam wall sections are brought into contact with the inner sides of the respective operating butts to minimize irregular motion of said each needle during knitting operation.

4,044,574

METHOD OF CLOSING THE TOE OPENING OF A KNIT STOCKING OR THE LIKE

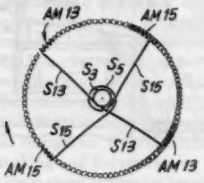
Arrigo Micheletti, Florence, Italy, assignor to Billi, S.p.A., Italy

Filed Oct. 3, 1968, Ser. No. 764,835

Claims priority, application Italy, Oct. 9, 1967, 4763/67

Int. Cl.[2] A41B *11/02*; D04B *9/42*

U.S. Cl. 66—187 **2 Claims**



1. The method of operating a circular knitting machine of the type having a circle of needles and having a circle of welt hooks associated with said circle of needles, which comprises knitting a first section of tubular fabric on said needles, positioning spaced needles at welt level with their last formed stitches of said first fabric section thereon, knitting a second section of tubular fabric of predetermined length on the intervening needles in continuation of the corresponding intervening wales of said first fabric section, holding the terminal course of said second fabric section on said circle of welt hooks, knitting a third section of tubular fabric of said predetermined length in continuation of said terminal course, said terminal course being a course common to said second and to said third fabric sections, said second and third fabric sections being nested and commonly extending between said circle of welt hooks and said intervening needles, winding yarn under tension peripherally around said nested tubular fabric sections midway of their length to constrict the same to effectively close the opening therein, whereby said pair of nested two-ply welts is closed at the fold line thereof to produce a closed toe for a stocking, activating said spaced needles, transferring said terminal course from said welt hooks to said spaced needles, knitting upon said circle of needles to join the terminal courses of said tubular sections to form a pair of nested, two-ply tubular welts, and knitting a further portion of tubular fabric on said needles.

4,044,575

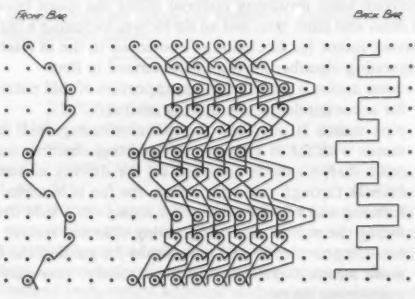
BALANCED BI-DIRECTIONAL STRETCH KNIT FABRIC

Herbert A. Krug, 402 Semino Road, Northvale, N.J. 00647

Filed Aug. 24, 1976, Ser. No. 717,134

Int. Cl.[2] D04B *23/08*

U.S. Cl. 66—192 **3 Claims**



1. A warp knitted stretch fabric capable of balanced bi-directional stretch having in combination an inelastic knitted

ground structure and elastic lay in, said ground structure comprising a plurality of courses and wales formed from single stitches, said single stitches being deposed in a six stitch repeating pattern, the first three stitches of said six stitch repeating pattern traversing diagonally to adjacent wales and courses, the fourth stitch of said six stitch repeating pattern being knitted in the same wale and adjacent course as the third stitch of said six stitch repeating pattern, the fifth and sixth stitches of said six stitch repeating pattern traversing diagonally from said fourth stitch to adjacent wales and courses said diagonally traversing being in a direction opposite that of the traversing of said first, second and third stitches, and an elastic thread extending through said ground structure and being held into said ground structure by the unknitted portions of said inelastic ground structure.

4,044,576

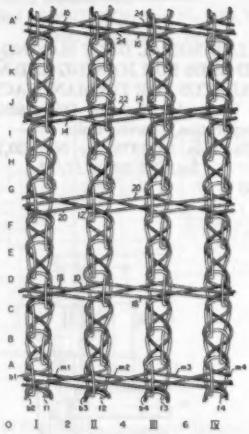
WARP-KNITTED FABRICS

Milton Kurz, Pond Crossing, Lawrence, N.Y. 11559

Filed Nov. 7, 1975, Ser. No. 629,851

Int. Cl.[2] D04B *23/08, 23/10*

U.S. Cl. 66—193 **4 Claims**



1. A warp-knitted fabric having a multiplicity of threads forming a multiplicity of wales and courses comprising a set of threads forming a multiplicity of interconnected contracted loops and two sets of laid-in threads arranged in pairs, each of the threads of said pairs including in each repeat of a knitting pattern at least two short lay-ins between wales and at least two long lay-ins between wales, there being for each long lay-in between wales of each thread of each pair a corresponding short lay-in between wales of the other thread of the pair which is located in the same course as and extends in the opposite direction from the said long lay-ins between wales, and the threads of each pair being mirror images of each other offset from each other by at least two courses and thus being of substantially equal total length in each repeat.

4,044,577

ANTI-THEFT DEVICE FOR PORTABLE APPARATUS

Albert F. Horlacher, Palatine, Ill., assignor to Lock-A-Bike, Inc., Winnetka, Ill.

Filed Sept. 9, 1976, Ser. No. 721,688

Int. Cl.[2] B62H *5/00*

U.S. Cl. 70—234 **17 Claims**

1. An automatic locking device adapted to be operably mounted on a support wwhich is rigidly formed with a bicycle or like portable instrument for releasably securing said instrument against theft, said locking device comprising:

i. a substantially enclosed casing;

ii. a spindle secured within said casing and having retractile reel means mounted thereon;

iii. said reel means including a flexible cable having one end secured thereto and a protruding second free end extending through said casing, and means for automatically retracting said cable when it is extended from said casing;

iv. latch means supported on said casing for latching said

reel means against movement in a first position, and for releasing said reel means for movement in a second position;

v. said free end of the cable arranged to be engaged through said casing with said latch means in said first position; and

vi. lock means supported on said casing for releasably locking said free end of the cable in said casing and concurrently preventing movement of the reel means and latch means.

4,044,578

SAFETY LOCK

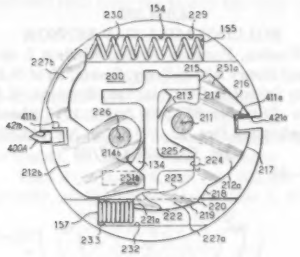
Francois Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France

Filed Jan. 9, 1976, Ser. No. 647,975

Claims priority, application France, Jan. 17, 1975, 75.01552

Int. Cl.[2] E05B *19/06, 29/06*

U.S. Cl. 70—366 **6 Claims**



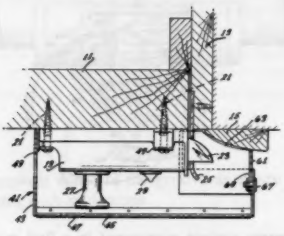
1. A safety lock comprising; a cylinder having a transverse end wall provided with an opening for the entrance of a key, a barrel within said cylinder, a number of notched cams located in transverse planes of the barrel and pivotally mounted around at least one axis extending parallely to the longitudinal axis of the lock, at least one longitudinal catch mounted between said barrel and said cylinder, and adapted to be received into said notches when they are aligned, thereby rotatively freeing the barrel with respect to the cylinder, and an aperture extending longitudinally into said barrel for said key the introduction of which within said barrel displaces said cams by acting on the portions thereof projecting into said axially directed aperture the latter having a central channel and two couples of shanks extending substantially perpendicularly to said channel, the shanks of each couple being offset with respect to one another.

4,044,579

PROTECTION MEANS FOR MANUALLY OPERATED DEAD BOLT LOCK

John Paul Le Bel, 238 1/2 S. Vendome St., Los Angeles, Calif. 90057

Filed Nov. 21, 1975, Ser. No. 630,072
Int. Cl.[2] E05B 13/00
U.S. Cl. 70—416 2 Claims



1. Apparatus for limiting access to a manually operable lock mountable on a door having a jamb upon which a striker element is mounted comprising

a housing adapted to surround such a lock and its striker on all sides thereof except on the side thereof against a door comprising

wall means arranged to extend substantially perpendicularly from a door and its adjacent jamb to an outer edge further from the door than the furthermost extremity of a lock and striker therefrom,

cover means moveably mounted on at least one portion of said outer edge and so formed as to substantially fill the area within the boundaries formed by said outer edge when moved into position thereagainst,

means for prohibiting unauthorized movement of said cover means, and

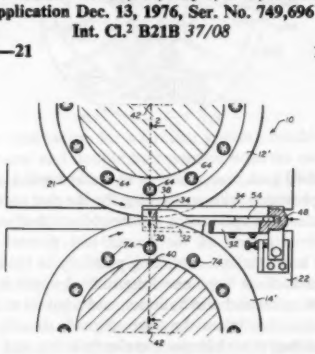
means within housing for receiving the means which fasten a manufally operable lock to a door so that the lock fastening means also fix said housing to the door.

4,044,580

ROLLING MILL GAP SENSOR

Donald A. Worden, Pompton Plains; William I. de Versterre, Warren, and Henry Alfred Petry, Sparta, all of N.J., assignors to Marotta Scientific Controls, Inc., Boonton, N.J.

Continuation of Ser. No. 592,540, July 2, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,696
Int. Cl.[2] B21B 37/08
U.S. Cl. 72—21 14 Claims



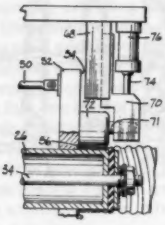
1. A rolling mill comprising a first and a second roll that rotate on parallel axes and that have cylindrical working faces which form a roll pass through which material travels to determine the gauge of said material, sensors for determining movement on the rolls toward and from one another including a first sensor that is adjacent to a circumferential area of said first roll at a location immediately adjacent to a center line extending through the axes of said rolls but axially spaced from the surfaces of the rolls that contact with the material that travels through the roll pass, a second sensor that is adjacent to a circumferential area of the second roll at a location immediately adjacent to a center line extending through the axes of said rolls and axially spaced from the first sensor and from the surfaces of the rolls that contact with the material that travels through the roll pass, said circumferential area of each of said first and second rolls being axially spaced from the corresponding circumferential area of the other roll and being substantially coaxial with its roll and of the same circumference as the cylindrical working face of its roll and located in position to be ground whenever the working face of its roll is ground and as part of the grinding operation whereby any eccentricity ground into the working face is duplicated in said circumferential area of the roll, one of the rolls having a circumferential recess between its working face and its circumferential area that is adjacent to one of the sensors for providing clearance for the sensor that is adjacent to the circumferential area of the other roll, a frame connected with the respective sensors, a transducer operated by relative movement in said frame, and apparatus responsive to signals from the transducer.

4,044,581

THIN-WALLED METAL DUCT HAVING INTEGRAL REINFORCED ENDS FOR JOINING AND METHOD AND APPARATUS FOR ITS MANUFACTURE

Robert Henry Meserole, Maumee, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 10, 1975, Ser. No. 630,123
Int. Cl.[2] B21D 51/12
U.S. Cl. 72—68 11 Claims



1. In a method of reforming at least one end portion on a tubular metal duct section having a wall with ribs therearound comprising at least partially removing the ribs from the least one end portion of the duct by working the wall of the at least one end portion to partially collapse the ribs and form generally cylindrical end portion, the improvement comprising;

compressing the duct lengthwise from the end containing the at least one end portion prior to working the wall of that one end portion such that the lengthwise distance between the ribs and the end portion is significantly less than the lengthwise distance between the ribs in an intermediate portion of the duct adjacent to said end portion.

4,044,582

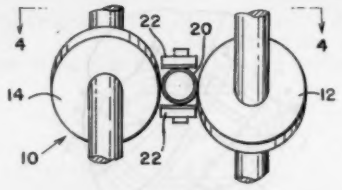
WORK GUIDE FOR PIPE REEL ING MACHINES AND THE LIKE AND PROCESS FOR TREATING THE SAME

Robert G. Griffith, Poland Township, Mahoning County, Ohio, assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed June 14, 1976, Ser. No. 695,903
Int. Cl.[2] B21B 39/14
U.S. Cl. 72—97 5 Claims

1. A pipe reeling machine external guide for guiding and burnishing an external surface of a pipe, said guide having a work contact surface of a composition consisting essentially, in

percent by weight, of: 0.70–0.90 carbon; up to 1.75 manganese, 0.08 max. phosphorus, 0.08 max. sulfur, 0.5–1.75 silicon, 8–12.0



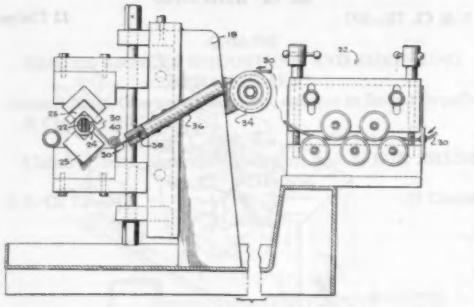
nickel, 23–27 chromium, and the balance being essentially iron with residual impurities.

4,044,583

METHOD AND APPARATUS FOR MAKING ELONGATED FLAT WIRE COILS

C. Mills Kinney, Jr., Washington, D.C., assignor to Wire Conveyor Belts, Inc., Easton, Md.

Filed May 27, 1976, Ser. No. 690,793
Int. Cl.[2] B21F *3/04*
U.S. Cl. 72—137 18 Claims



1. A method of forming an elongated flattened wire spiral of spring-like wire in a forming station having a continuously rotating elongated winding blade extending axially through a rigid flat spiral outfeed guide, said method comprising the steps of continuously feeding spring-like wire toward said forming station, bending said spring-like wire beyond its elastic limit in a first direction to impart a set bend in said wire at a location immediately upstream of said forming station, feeding said wire having said set bend into wrapped engagement with said winding blade between adjacent spirals of said flat spiral outfeed guide in a direction so that said wire is bent on said winding blade beyond its elastic limit in an opposite direction to said set bend as it is wrapped around said winding blade.

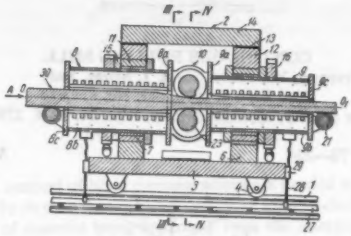
4,044,584

MILL FOR ROLLING CONTINUOUSLY CAST INGOT

Evgeny Alexeevich Korshunov, pereulok Otdelny, 5a, kv. 29, Sverdlovsk, U.S.S.R.

Filed Oct. 7, 1976, Ser. No. 730,649
Claims priority, application U.S.S.R., Oct. 15, 1976, 2177703
Int. Cl.[2] B21B *13/22*
U.S. Cl. 72—214 1 Claim

1. A mill for rolling a round continuously cast ingot, said mill rolling the ingot intermittently, and comprising: slideways running coincident with the axis of rolling and mounted on a foundation and a movable mill stand mounted in said slideways, said mill stand comprising: a stage-separator fitted with runners and travelling along said slideways; two pairs of braces fixed on said stage-separator; a top-mill separator interconnecting said braces; two supports with insertion pieces, said supports being installed along the axis of rolling on said stage-separator and being intermediate of said braces; two cylindrical inductors set up on said supports and having bodies with cylindrical shapes and end face parts, said inductors being adapted for establishing a travelling magnetic field therein; two pairs of flanges fixed on the cylindrical portions of the bodies of said inductors, the flanges, comprised in each flange pair mounted on each of said inductors, being spaced at a distance corresponding to a lengthwise size of the appropriate supports with the insertion piece, and the spacing between the pairs of said flanges set up on said inductors corresponding to that between the inductor supports; said inductors with the flanges are rotatably mounted on the insertion pieces of said



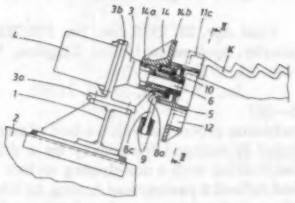
supports through an angle of at least 90° about the axis of rolling and are pressed to said insertion pieces by said top-mill separator, which precludes the displacement of said inductors relative to said supports towards the axis of rolling; and a mill roll unit disposed intermediate of the end faces of said inductor bodies and fixed rigidly to said end faces, said mill roll unit having two housings with openings, said housings being rigidly fixed on the end faces of said inductor bodies, two grooved rolls with lengthened necks introduced into the openings in said housings, two hydraulic drives mounted on one of said housings and coupled with the necks of said grooved mill rolls, and two gear wheels in mesh with each other fitted on the necks of said mill rolls from the side of the other of said housings.

4,044,585

ENTRY ROLLERWAY FOR A COOLING BED FOR ELONGATE ROLLED STOCK

Otto K. Buchheit, St. Ingbert, Germany, assignor to Moeller & Neumann GmbH, St. Ingbert, Saar, Germany

Filed June 3, 1976, Ser. No. 692,569
Claims priority, application Germany, June 5, 1975, 2525014
Int. Cl.[2] B21B *43/00*
U.S. Cl. 72—201 5 Claims



1. An entry rollerway for a cooling bed for elongate rolled stock, for example, rods or bars, comprising:

an elongated carrier means;

a plurality of lantern-shaped cast members mounted on said elongated carrier means at spaced locations therealong;

elongated cast members supported only on adjacent ones of said lantern-shaped cast members, and including bottom

and side wall portions defining an entry groove for said rolled stock;

a driven roller means carried by each of said lantern-shaped cast members, and arranged to extend into said entry groove generally transversely thereof;

pivot axis means also carried by each of said lantern-shaped cast members, each pivot axis means having a bell crank means rotatably mounted thereon;

a lifter element disposed to extend between each pair of said bell crank means, and pivotally connected thereto; and

an actuator rod means connecting all of said bell crank means, and operable to rotate said bell crank means from a position in which said lifter element(s) are flush with said bottom wall portions of said entry groove to a raised position in which said lifter element(s) eject rolled stock from said entry groove to said cooling bed.

4,044,586

CONTINUOUS ROLLING MILL

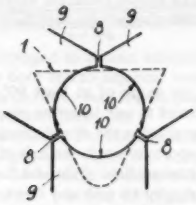
Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy

Filed Sept. 5, 1975, Ser. No. 610,817

Claims priority, application Italy, Sept. 20, 1974, 27526/74

Int. Cl.[2] B21B *1/04, 27/02*

U.S. Cl. 72—224 **5 Claims**



1. A continuous rolling mill having rolling units with three rolls for rolling an ingot originating from a continuous casting machine of the wheel and band type, said ingot having a substantially triangular or trapezial cross-section of mutually proportional sides, the rolling mill comprising at least a first rolling unit with three rolls each having rolling grooves of equal geometry configured as an arc of a circle, to define a substantially circular passage dimensioned so that a surface portion of the ingot is untouched by the rolls during rolling, this surface portion being not greater than approximately 15% of the surface touched by the rolls.

4,044,587

FORMING OF MATERIALS BY EXTRUSION

Derek Green, Cumbria; John Alan Pardoe, Lytham St. Annes, and Clifford Etherington, Blackpool, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

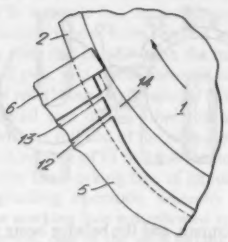
Filed Apr. 23, 1975, Ser. No. 570,753

Claims priority, application United Kingdom, May 7, 1974, 20120/74; Oct. 24, 1974, 46035/74

Int. Cl.[2] B21C *23/01, 33/00*

U.S. Cl. 72—261 **6 Claims**

1. In an extrusion process in which a feed of metallic material to be extruded is engaged frictionally by a driving surface which in conjunction with a non-driving surface also engaged with the feed defines a passageway having an inlet end and an extrusion die end, the driving surface having a feed-engaging area which is greater than that of the non-driving surface over at least a sufficient length of the passageway for the requisite extrusion pressure to be developed in the feed by a frictional drag effect, the improvement for extruding to a product having a cross-sectional dimension larger than any cross-sectional dimension of the feed, characterized in that the cross-sectional area of the passageway is changed along its length in the direction from the inlet end of the passageway to the extrusion die end of the passageway in a manner such that at least one cross-sectional dimension of the passageway at the die end thereof is



greater than the corresponding dimension at the inlet end thereof, and such that shape deformation of the feed occurs during the passage of the feed along the passageway.

4,044,588

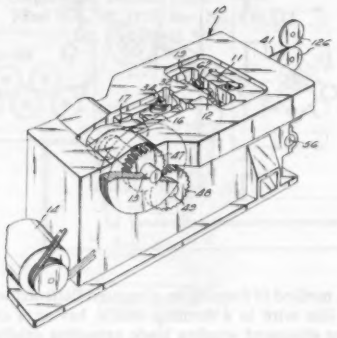
HIGH SPEED BALL HEADER

Allan D. Haines, Tiffin, Ohio, assignor to The National Machinery Co., Tiffin, Ohio

Filed June 25, 1976, Ser. No. 699,892

Int. Cl.[2] B21D *28/00*

U.S. Cl. 72—337 **22 Claims**



1. A header comprising a frame, a stationary die mounted on said frame, a movable die mounted on said frame for movement relative to said stationary die between an extended position adjacent to such stationary die and a retracted position spaced from stationary die, a powered slide operable to a forward position to move said movable die to said extended position causing a blank to be formed by said dies, a transfer operable to position a blank for gripping by said dies, and control means operable independent of slide movement to cause movement of said movable die to a position in which said dies grip a blank held by said transfer.

4,044,589

ROTARY PISTON MACHINES

Robert Edwin Waimsley, Buckinghamshire; Robert Oliver, Berkshire, and Norman Ernest Fisher, St. Albans, all of England, assignors to Vandervell Products Limited, London, England

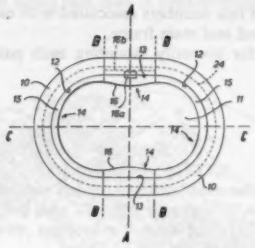
Continuation-in-part of Ser. No. 381,353, July 20, 1973, Pat. No. 3,973,883. This application Apr. 21, 1976, Ser. No. 679,092

Int. Cl.[2] B21D *28/00*

U.S. Cl. 72—341 **7 Claims**

1. A method of manufacturing a liner element having a trochoidal shaped inner surface for a housing of a rotary piston machine comprising the steps of extruding a flat strip, machin-

ing or rolling the flat strip to provide a variation in the thickness of the strip along the length thereof and then bending the strip into semi-circular form to fit in the housing, said variation



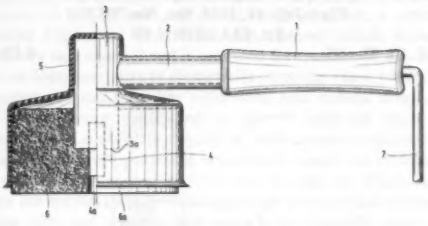
in thickness of the bent strip being such that the inner surface of the strip is trochoidal shaped when the outer surface of the strip is semi-circular.

4,044,590

DENTED ARTICLE SMOOTHING AND SHRINKING ARRANGEMENT

Anton Strahm, Oberweier, Germany, assignor to Robert Brendle & Cie., France

Filed Apr. 8, 1976, Ser. No. 675,241
Claims priority, application Germany, Apr. 8, 1975, 2515296
Int. Cl.² B21D *1/06*
U.S. Cl. 72—342 **29 Claims**



1. An arrangement for smoothing and shrinking a dented article, the arrangement comprising:

an electrode means for effecting a heating of at least a portion of the article, said electrode means including an end face for contacting the article, said electrode means and the dented article being connectable with a voltage source means;

a cooling means provided at said electrode means for cooling at least a portion of the article affected by said electrode means, said cooling means consisting of a means for selectively impermanently taking up a cooling fluid having an outer end surface which is aligned with said end face of said electrode means; and

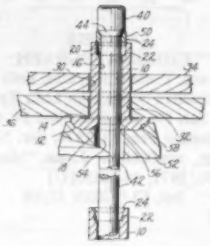
a shield means mounted at said electrode means so as to be coaxial therewith for shielding the electrode means, said shield means including a cylindrical casing means for accommodating said cooling means, said cylindrical casing means defining an annular space between said electrode means and said casing means with said cooling means being accommodated in said annular space.

4,044,591

BLIND RIVET AND IMPROVED METHOD OF BLIND RIVETING

John Powderley, Birmingham, England, assignor to USM Corporation, Boston, Mass.

Filed June 29, 1976, Ser. No. 700,909
Claims priority, application United Kingdom, July 23, 1975, 30725/75
Int. Cl.² B21J *15/34*; F16B *21/00*
U.S. Cl. 72—391 **6 Claims**



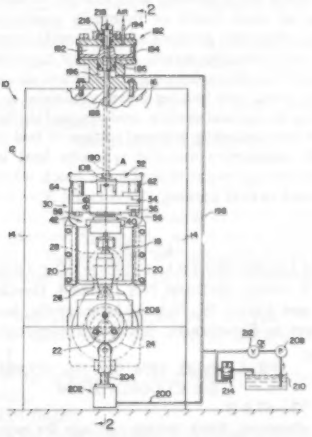
1. A method of blind riveting wherein a headed mandrel is pulled by its stem through a succession of axially tubular rivets, a ring of material being separated from the interior of each rivet by the mandrel head and being retained on the mandrel stem until the mandrel head is pulled through the ring in the setting of the next rivet in the succession.

4,044,592

COINING DIE ASSEMBLY

Louis F. Carrieri, La Grange Park, Ill.; James R. Brownell, Delton, Mich.; Robert A. Helrigel; Roderick K. Ward, both of Hastings, Mich., and Jerome J. Wroblewski, Clarendon Hills, Ill., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed May 19, 1976, Ser. No. 688,019
Int. Cl.² B21J *13/02*
U.S. Cl. 72—462 **28 Claims**



1. A unitary coining die assembly for mounting on a press having a frame and slide means reciprocable in opposite directions relative to said frame, said die assembly including first coining die means, second coining die means, support means for said first and second coining die means and supporting said second coining die means for reciprocation between first and

second positions relative to said first coining die means, said second coining die means in said first position being spaced from said first coining die means for a coin blank to be received therebetween, said second coining die means in said second position being cooperable with said first coining die means to shape said blank, means biasing said second coining die means toward said first position, and said support means including means to mount said die assembly on said frame for reciprocation of said slide means in one of said opposite directions to engage and displace said second die means from said first position toward said second position.

4,044,593

CHROMATOGRAPH

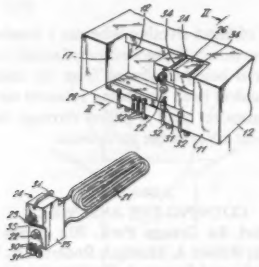
Tatsuro Haruki, and Yoshiro Hayashi, both of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Continuation of Ser. No. 201,646, Nov. 24, 1971, abandoned. This application Feb. 13, 1974, Ser. No. 442,055

Claims priority, application Japan, Mar. 31, 1971, 46-23282[U]; Mar. 31, 1971, 46-23283[U]

Int. Cl.² G01N *31/08*

U.S. Cl. 73—23.1 **9 Claims**



1. A chromatograph comprising a housing having walls defining a column chamber; a plurality of blocks constituting at least a portion of said housing walls so that said blocks are selectively detachable from said housing wall portion, at least one of said blocks carrying thereon a sample introducing portion, a column and a detector so as to form an analysis unit and including an inner block of thermally conductive material enclosing substantial portions of said sample introducing portion and said detector means; means for supplying a carrier fluid to said sample introducing portion; and means for heating said inner block, said heating means contained in said housing and having an exposed surface, said exposed surface adapted to contact a corresponding exposed surface of said inner block of thermally conductive material whereby heat is transferred from said heating means to said inner block when said blocks are attached to said housing.

4,044,594

ULTRASONIC TRACK TESTING CARRIAGE

William T. Owens, Elmhurst, N.Y.; Albin A. Davidson, St. Louis Park, and Eldrid W. Nelson, Minneapolis, both of Minn., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed July 22, 1976, Ser. No. 707,899

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.8 S **50 Claims**

1. An ultrasonic track testing carriage for movement along rails in operative relationship with a test vehicle, comprising:

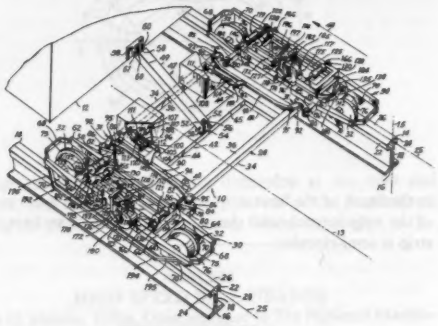
A. a pair of wheel frames each having guide means for following the gauge side of the rail and ultrasonic sensing means mounted in working relationship with a portion of the rail for detecting changes in the rail and the position of said sensing means relative to the rail,

B. a main frame disposed between said wheel frames and adapted to be coupled to the test vehicle for movement therewith, and

C. interconnecting means between said main frame and each of said wheel frames, said interconnecting means including:

1. a pair of link members associated with each said wheel frame and said main frame,

2. means for pivotally mounting each pair of said link



members in spaced apart relationship to each other between said wheel frames and said main frame, and

3. coupling means for pivotally joining each pair of said link members together to provide a connection therebetween so as to permit each said wheel frame independent freedom of motion relative to said main frame in a plane substantially perpendicular to the gauge side of the rail while simultaneously maintaining parallelism between said wheel frames.

4,044,595

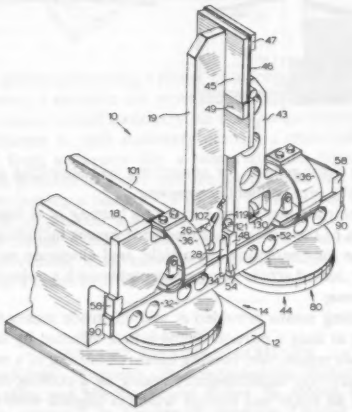
SHORT SPAN TENSILE TESTER SYSTEM

Bote G. Bruinsma, 2795 Bates Road, Montreal, Quebec, Canada

Filed July 19, 1976, Ser. No. 706,923

Int. Cl.² G01N *3/08*

U.S. Cl. 73—95 **6 Claims**



1. Testing apparatus for testing the tensile strength of a web of sheet material, having two pairs of clamping jaws in adjacent clamping relation for clamping adjoining portions of sheet material over a minimal zero gauge length, force applying wedge means to force one pair of jaws away from the other pair of jaws to cause rupture of the web, and force measuring means to measure the force required to rupture the web, one

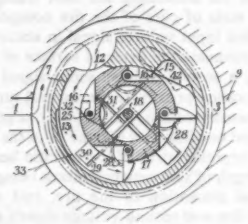
said pair of jaws comprising opposed first and second jaw portions, spring means extending between said first and second jaw portions to position them in mutual resiliently spaced relation, said spring means having substantially a single degree of freedom, to retain said jaws in predetermined self indexing relation.

4,044,596

VOLUMETRIC METER

Yves Luce, 1 bis rue Rabelais, 93100 Montreuil, France

Filed July 22, 1976, Ser. No. 707,685
Claims priority, application France, Aug. 11, 1975, 75.24928
Int. Cl.² G01F *1/07*
U.S. Cl. 73—260 **1 Claim**



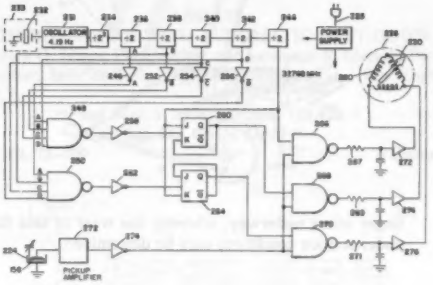
1. Volumetric meter for measuring the output of a liquid flowing therethrough, which comprises a case having at least one aperture formed therein for introducing the liquid of which the output is to be measured, at least one liquid outlet aperture, and an inner circular channel connecting one inlet aperture to one outlet aperture, said liquid being led to flow through said channel for circulating from said at least one inlet aperture to said at least one liquid outlet aperture, a central member concentric to said circular channel which bounds internally said channel and is mounted for free rotation in said case, at least two pairs of diametrally opposite vanes pivotally mounted on, and rotatably rigid with, said central member, said vanes being distributed at spaced intervals on, and mounted at the outer periphery of, said central member between a first end position in which said vanes are retracted towards the center and another end position in which said vanes are spread radially outwards so as to close said channel in this other end position, said vanes being normally urged to said other end position by the pressure of the liquid stream flowing through said channel, and wherein each pair of successive vanes form therebetween in said channel, between one inlet aperture and one outlet aperture of said channel, a predetermined volume of liquid of which the output is to be measured, means for positively controlling the return of each previously spread vane to its retracted position after the vane concerned, during its pivotal movement in said channel, has bounded with the next following vane said predetermined volume of liquid, a diametral slide, rigid with said central member, operatively associated with each pair of diametrally opposite vanes, a toothed circular segment rotatably rigid with, and coaxial to, each vane, and a rack at either end of each diametral slide, each rack being in constant meshing engagement with the circular toothed segment of the associated vane, whereby the retraction of one towards the center of the meter will control the radial spreading of the diametrically opposite vane, said vice versa, and a shaft coaxial to and rotatably rigid with said central member, each revolution of said shaft corresponding to a predetermined output of the liquid flowing through said meter.

4,044,597

FREQUENCY TUNING SYSTEM WITH VISUAL DISPLAY

Bruce G. Erickson, Santa Clara, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Division of Ser. No. 578,606, May 19, 1975, Pat. No. 4,024,750.
This application Sept. 13, 1976, Ser. No. 723,035
Int. Cl.² G04D *7/12*
U.S. Cl. 73—6 **3 Claims**



1. A visual timing aid system for aligning a time base signal generator in an electronic timepiece to a correct frequency including:

reference signal generator means for generating a reference signal at a frequency integrally related to said correct frequency;

sensor means for sensing and selectively amplifying a time base signal generated by the time base signal generator in a said electronic timepiece to be aligned;

phase change indicator means connected to said reference signal generator and to said sensor means for indicating by a relative movement the rate of phase change between said reference signal and said time base signal, said phase change indicator means including a multiphase motor having an armature element attached to a display indicator and a multiphase shifting network of the same number of phases as said motor and connected thereto and to said reference signal generator means and to said sensor means, for driving said motor with a drive signal proportional to the rate of change between said reference signal and said sensed time base signal;

whereby alignment of said time base signal generator to said correct frequency eliminates said phase change, and thereupon said display indicator ceases said relative movement indicating alignment of said time base signal generator to said correct frequency.

4,044,598

PERFORMANCE EVALUATION FACILITY FOR SEAL SKIRT-FINGERS OF SURFACE EFFECT SHIPS

Alexander B. Stavovy, Springfield, and Richard H. Chiu, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1976, Ser. No. 710,946
Int. Cl.² G01N *3/56*; G01M *10/00*; B63B *9/00*
U.S. Cl. 73—7 **10 Claims**

1. A system for testing seal skirt fingers of surface effect ships comprising:

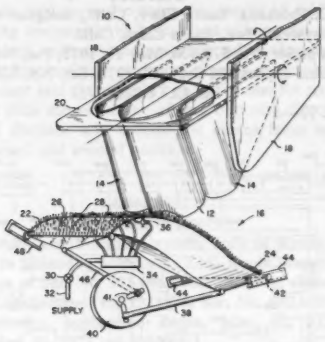
a sample skirt finger;

a first means for moving sample skirt finger to simulate both pitch and roll motion of an actual skirt finger on a surface effect ship underway;

an adjustable second means producing a flow of water over said finger's surface to simulate the effect of waterflow on said finger when said finger is mounted on a surface effect ship underway;

a third means for simulating an ocean wave profile and

operatively connected to said second means for contacting and flexing said finger to simulate movement of said



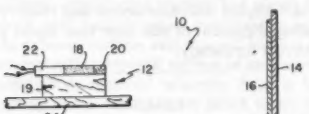
finger when underway, whereby the wear of said finger under service conditions may be determined.

4,044,599

TEST SYSTEM FOR EVALUATION OF ARMORS USING DUPLICATE FRAGMENTS

David Goldstein, Adelphi; William C. Pless, Havre de Grace; Michael Shapiro, Oxon Hill, all of Md.; Dana Spencer, Woodbridge, Va., and Leland E. Starr, Jr., Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 663,003
Int. Cl.² G01N *3/08*
U.S. Cl. 73—12 **9 Claims**



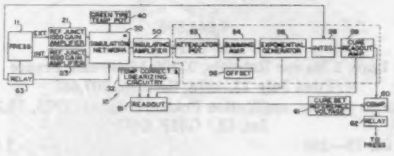
1. A test system for evaluating material comprising:
a projectile propulsion unit;
a plurality of fragments propelled by said propulsion unit as a layer;
a target for receiving the fragments;
a stroboscopic light source means for periodic illumination of the test system and the fragments in flight;
a photographic means responsive to said light source to record the test results;
said projectile propulsion unit comprising a propelling charge producing a plane shock wave without the use of a launch barrel for the propulsion of said fragments in a layer; and
ignition means to initiate detonation of said propelling charge.

4,044,600

TIRE CURE AND HEAT TRANSFER SIMULATOR

William E. Claxton, Mogadore, and Harold C. Holden, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 222,345, Jan. 31, 1972, abandoned, which is a continuation of Ser. No. 1,799, Jan. 9, 1970, abandoned. This application Aug. 19, 1974, Ser. No. 498,395
Int. Cl.² B29H *5/02*; G01N *25/00*
U.S. Cl. 73—15 R **17 Claims**



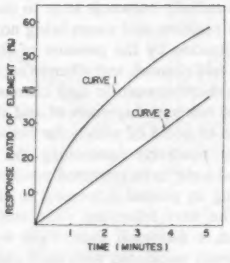
1. Apparatus for simulating the heat transfer in a tire to determine the state of cure of the tire comprising means for generating a first input voltage signal in accordance with the temperature proximate the external surface of the tire, means for generating a second voltage input signal in accordance with the temperature proximate the internal surface of the tire, simulation network means having at least one resistor representative of the heat conductivity parameter of the tire and at least one capacitor representative of the specific heat parameter of the tire, the length of said network means being representative of the physical dimension of the tire, said network means receiving said first and second voltage signals and providing a selective output signal in accordance with the temperature of a selective point internally of the tire, means establishing said selective output signal as an exponential representation of the temperature of said selective point internally of the tire relative to a reference temperature, and integrator means for integrating said exponential output signal to provide a signal proportional to an equivalent cure factor.

4,044,601

SMOKE AND GAS SENSOR ELEMENT

Yo Sakurai, Kunitachi; Hidehito Obayashi, and Tetsuo Gejyo, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 29, 1975, Ser. No. 600,052
Claims priority, application Japan, July 29, 1974, 49-86095
Int. Cl.² G01N *27/12*
U.S. Cl. 73—23 **22 Claims**



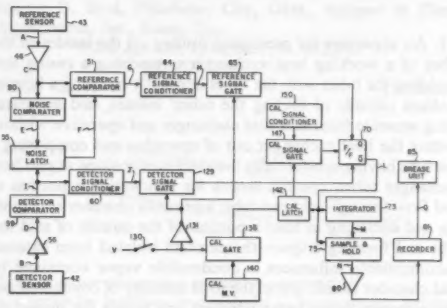
1. In a sensor device for detecting the presence of smoke and/or a gaseous substance in an atmosphere, said sensor device including a sensor element whose resistance changes with the presence of said smoke or gaseous substance, said sensor element having a surface capable of coming into contact with said atmosphere and a means for indicating the presence of said smoke or gaseous substance in said atmosphere in response to a change in the resistance of said sensor element, the improvement wherein said sensor element is formed from a material comprising:

1. a complex metal oxide having a perovskite type crystal structure and represented by the general formula $ABO_{3-\delta}$, wherein A is at least one element selected from the group consisting of yttrium, a rare earth element of an atomic number from 57 to 71, and an alkaline earth metal, B is at least one element selected from the group consisting of transition metals of the atomic numbers from 21 to 30, O is oxygen and δ is a nonstoichiometric parameter, and
2. at least one metal oxide selected from the group consisting of CdO, In_2O_3, SnO, Tl_2O_3 and PbO.

4,044,602
CONSISTOMETER WITH INTERNAL CALIBRATION MEANS

Kenneth O. Higgs, Port Neches, and Lawrence F. Marsch, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,626
Int. Cl.² G01N *11/14*
U.S. Cl. 73—59 **4 Claims**

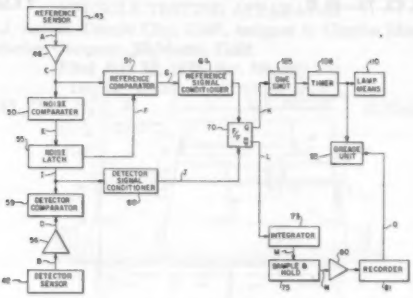


1. A consistometer for continuous measuring the consistency of a stream of material from apparatus manufacturing the material comprising a rotatable resilient member located in said stream so that the opposite surface about which said member is flexible is substantially parallel to the direction of flow in said stream, means for rotating said member at a constant rotate about an axis which is parallel to the direction of flow in said stream, a reference member, means for rotating the reference member in synchronism with the resilient member, resilient member sensing means spatially related to the resilient member for providing a resilient member signal in accordance with the movement of the resilient member, reference member sensing means spatially related to the reference member for providing a reference member signal in accordance with the movement of the reference member, noise means connected to both sensing means for providing an enabling pulse in accordance with the reference member signal and the resilient member signal, first comparison means connected to the reference member sensing means and to the noise means for comparing the reference member signal with a predetermined voltage, corresponding to an acceptable reference member signal level, when enabled by an enabling pulse, and providing a first comparison signal at one level when the reference member signal is an acceptable signal and at another level when it is not acceptable and for not making the comparison when the noise means does not provide an enabling pulse when not making the comprison; reference member pulse means connected to the first comparison means for providing a reference member pulse in response to the first comparison signal going from the other level to the one level; resilient member pulse means connected to the resilient member sensing means for providing a resilient member pulse in accordance with the resilient member signal; a flip-flop connected to both pulse means provides a signal corresponding to the consistency of the material, in accordance with the resilient member, member pulses and the reference member pulses; output means connected to the flip-flop for providing an output corresponding to the consistency of the material in accordance with the signal from the flip-flop; and calibration means connected to the flip-flop, the resilient member pulse means and to the resilient member pulse means for providing calibration pulses of a predetermined repetition rate to the flip-flop while blocking the resilient member pulses and the reference member pulses so that output means may be calibrated.

4,044,603
CONSISTOMETER WITH AUTOMATIC SHUT-DOWN

Kenneth O. Higgs, Port Neches, and Lawrence F. Marsch, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,628
Int. Cl.² G01N *11/14*
U.S. Cl. 73—59 **4 Claims**



1. A consistometer for continuously measuring the consistency of a stream of material from apparatus manufacturing the material comprising a rotable resilient member located in said stream so that the opposite surfaces about which said member is flexible are substantially parallel to the direction of flow in said stream, means for rotating said member at a constant rate about an axis which is parallel to the direction of flow in said stream, a reference member, means for rotating the reference member in synchronism with the resilient member, resilient member sensing means spatially related to the resilient member for providing a resilient member signal in accordance with the movement of the resilient member, reference member sensing means spatially related to the reference member for providing a reference member signal in accordance with the movement of the reference member, noise means connected to both sensing means for providing an enabling pulse in accordance with the reference member signal and the resilient member signal, first comparison means connected to the reference member sensing means and to the noise means for comparing the reference member signal with a predetermined voltage, corresponding to an acceptable reference member signal level, when enabled by an enabling pulse, and providing a first comparison signal at one level when the reference member signal is an acceptable signal and at another level when it is not acceptable and for not making the comparison when the noise means does not provide an enabling pulse when not making the comparison; reference member pulse means connected to the first comparison means for providing a reference member pulse in response to the first comparison signal going from the other level to the one level; resilient member pulse means connected to the resilient member sensing means for providing a resilient member pulse in accordance with the resilient member signal; a flip-flop connected to both pulse means provides a signal corresponding to the consistency of the material, in accordance with the resilient member pulses and the reference member pulses; output means connected to the flip-flop for providing an output corresponding to the consistency of the material in accordance with the signal from the flip-flop; and control

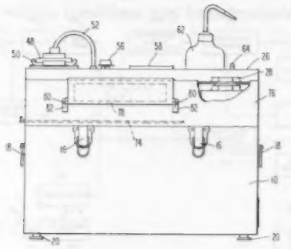
means connected to the flip-flop and to the apparatus for controlling the apparatus in accordance with the signal from the flip-flop so that the apparatus continues to manufacture the material when the flip-flop provides a signal which alternately changes level and to prevent the apparatus from manufacturing the material when the signal from the flip-flop does not change levels.

4,044,604

PORTABLE CONTAMINATED FUEL DETECTOR WITH TIERED DECK

Daniel G. Russ, Fort Wayne, Ind., assignor to Telectro-Mek, Inc., Fort Wayne, Ind.

Filed June 15, 1976, Ser. No. 696,273
Int. Cl.² G01N *21/34, 33/22*
U.S. Cl. 73—61 R **7 Claims**



1. A combination contaminated fuel detector, comprising at least sample holder means, fuel filter means in a filter retainer, a vacuum receptacle arranged in series with means causing said parts to seal together upon drawing a vacuum to accelerate flow of fuel through the filter means into the vacuum receptacle and vacuum pump means for said purpose connected by a vacuum line to said vacuum receptacle, and a free water detector, comprising a sample holder for a filter sample in close proximity to a plurality of comparison standards representative of different water content levels against which the sample may be compared and a light source positioned to illuminate the sample holder and comparison standards and providing an ultraviolet light to cause chemicals in a treated filter pad subject to free water from a fuel sample passed therethrough and the comparison standards to fluoresce, the intensity of sample fluorescence being a function of the amount of free water, the improvement comprising combining the two detectors in a single unit and providing

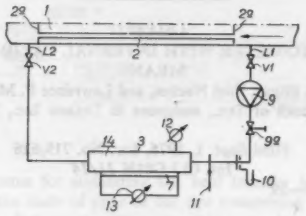
a box enclosure including a top and bottom, a tiered deck supported on said bottom for supporting, in turn, a photosensor filter examination system, including at least a light source, a filter holder and a photosensor and a meter means coupled to said photosensor, an entrance to the vacuum receptacle including a removable filter retainer, the top cover enclosing parts projecting above the deck tiers and the tiers serving to provide a better view of all parts on display, a slide element being insertable into the enclosure beneath, spaced from, and generally parallel to one of the tiered decks supported on a slide support to be positionable in sequence beside standards located proximate to the slide between the slide and the deck, a source of ultraviolet light being positioned beneath the deck and spaced above the sample holder and standards and a viewing opening being provided in a vertical connecting wall between the tiered deck region beneath which the slide is located and the lower deck element so as to be enclosed within the top cover.

4,044,605

APPARATUS FOR MEASURING FOULING ON THE INSIDE OF A HEAT-EXCHANGER TUBE

Lars Bratthäll, Linkoping, Sweden, assignor to Stal-Laval Apparat AB, Linkoping, Sweden

Filed Nov. 12, 1975, Ser. No. 630,946
Claims priority, application Sweden, Nov. 15, 1974, 7414392
Int. Cl.² G01N *25/18*
U.S. Cl. 73—61.2 **4 Claims**



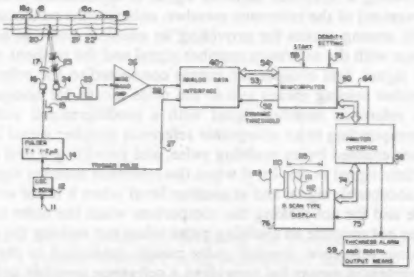
1. An apparatus for measuring fouling on the insides of the tubes of a working heat exchanger comprising a casing surrounding the tubes with the tubes internally carrying a flow of medium capable of fouling the tubes' insides; said apparatus being separate from said heat exchanger and operative without putting the heat exchanger out of operation and comprising a test tube having substantially the same composition as said heat exchanger tubes, conduit means for conducting a portion of said flow through said test tube, a pressure chamber surrounding and enclosing at least a portion of the outside of said test tube and forming a space therearound isolated from external uncontrollable influences, a condensible vapor contained by said chamber in said space, the total quantity of condensed and uncondensed vapor being constant and means for measuring the fluid pressure in said space as determined by the condensation of said vapor in the space.

4,044,606

SENSING THICKNESS OF A THIN BODY DISPOSED BETWEEN TWO DIVERSE SURFACES

Lester Robert Le Blanc, 80 Highland Ave., Narragansett, R.I. 02882, and Foster Hugh Middleton, Curtis Corner Road, Peace Dale, R.I. 02879

Filed June 11, 1976, Ser. No. 695,144
Int. Cl.² G01N *29/00*
U.S. Cl. 73—67.7 **7 Claims**



1. Apparatus for indicating the thickness of a layer of oil floating on a moving body of water comprising in combination,

acoustic pulser apparatus comprising an ultrasonic transducer adapted to be positioned beneath the surface of said body of water and adapted to repetitively transmit discrete pulses of wave energy in a narrow beam at a predetermined repetition frequency from said body of water

along a path through said layer of oil and into the atmosphere thereabove,

a float for supporting said transducer in said body of water, said float being of a size to encompass a large enough surface area to track with waves on the oil-water surface to average out the effect of wave motion,

acoustic receiver apparatus adapted to detect noise and reflected pulses from said beam including some discrete signals reflected from the oil-water interface and some discrete signals reflected from the oil-atmosphere interface,

dynamic threshold apparatus for rejecting reflected energy and noise having a predetermined amplitude below the amplitude of discrete signals reflected from the oil-water interface,

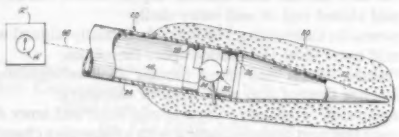
and means for translating the time span between the pulses reflected from the two said interfaces into an indication of the thickness of said layer of oil.

4,044,607

GRAIN MOISTURE MEASUREMENT PROBE

Clarence D. Deal, Oklahoma City, Okla., assignor to Electromeasures, Inc., Ennis, Tex.

Filed Apr. 30, 1976, Ser. No. 682,013
Int. Cl.² G01R *27/26*
U.S. Cl. 73—73 **11 Claims**



1. A moisture measuring apparatus comprising:

a. a probe for insertion into material to be measured, having a housing of dielectric material;

b. means for generating a divergent electrostatic field substantially symmetrical about the probe housing and having a major portion thereof extending externally of the housing, said means including a pair of capacitance electrodes disposed within said probe physically isolated by said housing from the material to be measured,

c. a frequency generating circuit including said electrodes, said frequency generating circuit providing an output signal having a frequency dependent upon the capacitance between said electrodes, and

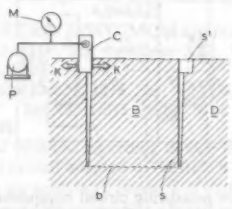
d. readout means connected to receive said output signal.

4,044,608

METHOD FOR IN SITU DETERMINATION OF CONCRETE STRENGTH

Randulf Inge Johansen, Trondheim, Norway, assignor to A/S Trondhjems Nagle & Spigerfabrik, Trondheim, Norway

Filed May 26, 1976, Ser. No. 689,984
Claims priority, application Norway, June 5, 1975, 751978
Int. Cl.² G01N *3/20*
U.S. Cl. 73—88 C **3 Claims**



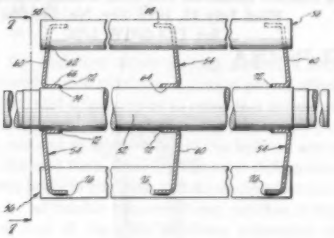
1. A method for in situ determination of concrete strength in a concrete structure or parts thereof, wherein the flexural strength of the concrete is determined at a test section located a certain distance from the surface of the concrete structure and preferably parallel thereto, said method comprising establishing the test section by arranging a tubular form element of a certain length in freshly poured and levelled concrete and extending down from the surface thereof, allowing the concrete to harden at least partly, removing the form element from the hardened or partly hardened concrete to leave in the concrete a slit surrounding a concrete core projection having a shape corresponding to the dimensions of the form element, and then subjecting the concrete core to a bending test by applying a recordable force at a place in the slit opening between the concrete core and the surrounding concrete until rupture occurs at the test section where the core is connected to the remainind concrete.

4,044,609

WHEEL-ENGAGING ROLLER STRUCTURE FOR VEHICLE TESTING APPARATUS

Carl J. Asmus, Temple City, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed July 18, 1975, Ser. No. 597,170
Int. Cl.² G01M *15/00*; G01L *5/28*
U.S. Cl. 73—117 **10 Claims**



1. A roller adapted to engage and drive a wheel for testing purposes, comprising:

a shaft extending along the axis of rotation of the roller at least part of the roller's axial length,

a plurality of generally disc-shaped supporting members secured to the shaft at axially spaced points and extending generally radially outward from the shaft,

said disc-shaped supporting members each having a plurality of circumferentially-spaced slots formed in its periphery and axially aligned with corresponding slots in the other supporting member or members, and

a plurality of axially extending wheel-engageable members secured to the disc-shaped members and supported in the slots formed therein, each said wheel engageable member having a substantially V-shaped cross-section, each side of which provides a wheel-engageable rib.

4,044,610

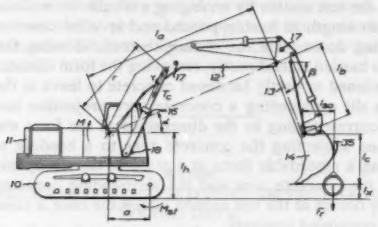
EXCAVATORS

Karl Olof Oldaeus, Landskrona; Osten Lars Tordenmalm, Sodra Sandby, and Nils Bo Nilsson, Eslov, all of Sweden, assignors to Akermans Verkstad AB, Eslov, Sweden

Filed Mar. 10, 1976, Ser. No. 665,699
Claims priority, application Sweden, Mar. 12, 1975, 75027599
Int. Cl.² E02F *9/26*
U.S. Cl. 73—133 R **4 Claims**

1. In an excavator, including a chassis, a turret rotatable relative thereto, and an excavation assembly mounted on said turret and including a boom, a stick and a shovel, the improvement comprising angular measurement devices placed on at least the boom and the stick and arranged to measure, by means of the gravitational force, the angle of the boom and the stick, respectively, relative to the horizontal plane, and an evaluation instrument to which all of the angular measurement devices

are connected and which is arranged to indicate the excavation depth on the basis of the length of the boom and the stick and



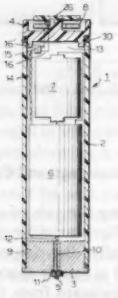
by means of the values received from the measurement devices.

4,044,611

EXPENDABLE OCEANOGRAPHY PROBE

Yuichi Kaname, Kaizuka; Masaya Nakajima, Neyagawa, and Katumi Tabuchi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 15, 1975, Ser. No. 596,564
Int. Cl.² G01W *1/00*
U.S. Cl. 73—170 A **13 Claims**



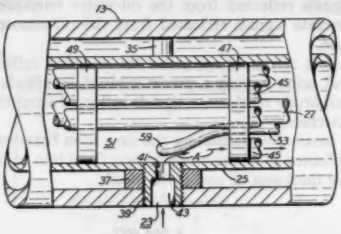
1. An expendable oceanography probe of the free-falling type comprising: a hollow cylindrical housing; a front end weight element hermetically fitted into the lower end of said cylindrical housing; a sensor mounted on the external surface of said front end element for detecting information relating to water to be tested, said external surface of said front end element being a flat surface: an oscillating circuit electrically coupled to said sensor and the oscillating frequency of which is changed according to the signal from said sensor; an electroacoustical disk transducer to operate in radial vibration mode and electrically coupled with said oscillating circuit for radiating a sound signal corresponding to the detected information into water around the probe; a transducer holder hermetically mounted on the upper end of said cylindrical housing and having an end surface facing outwardly of the probe, a center axle on the end surface and a cylindrical wall around said end surface; and a rear end disk plate, said transducer having a center hole and being mounted within said cylindrical wall and over said center axle with said center axle extending through said hole and said rear end disk plate attached to said axle for holding said transducer on said transducer holder, said probe having an apparent density in the range of about 1.9 grams/cm³ to 2.8 grams/cm³, the center of gravity of said probe being positioned at a point between the lower end and one third the length of the probe from the lower end and along the central longitudinal axis of said probe.

4,044,612

PROBE FOR OBTAINING GAS SAMPLES FROM A SHAFT FURNACE

Russell A. Powell, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 14, 1977, Ser. No. 759,430
Int. Cl.² G01N *1/26*
U.S. Cl. 73—341 **10 Claims**



1. Apparatus adapted to take samples of gas from a plurality of locations within the burden in a shaft furnace and to measure the ambient temperature in said furnace at said locations, comprising:

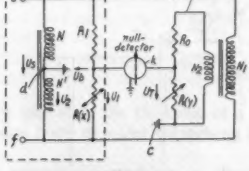
a. a hollow tubular outer shell having one shaped closed end adapted for penetrating said burden;
b. a hollow tubular inner shell having one closed end adjacent said closed end of said outer shell;
c. means for maintaining said inner shell axially aligned within said outer shell and spaced apart therefrom;
d. means within said inner tubular shell subdividing the interior thereof into a plurality of chambers;
e. a plurality of gas entry ports in said outer and inner shells, each said port communicating with a respective chamber in said inner shell;
f. an axial supporting member extending lengthwise within said tubular inner shell;
g. a plurality of gas sampling conduits arranged around said axial supporting member in spaced relation thereto, each said gas sampling conduit communicating with a respective chamber in said inner shell;
h. a plurality of sheathed thermocouples arranged around said axial supporting member and disposed between said gas sampling conduits and said axial supporting member, each sheathed thermocouple terminating in a sensing end disposed in a respective chamber in said inner shell; and
i. means for flowing a cooling fluid in the annulus between said inner and outer shells.

4,044,613

DIRECT READING TEMPERATURE MEASURING BRIDGE CIRCUIT

Arnfried Preuss, Bordesholm, Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Germany

Filed Feb. 21, 1975, Ser. No. 551,943
Claims priority, application Germany, Mar. 1, 1974, 2409841
Int. Cl.² G01K *7/20*; G05F *3/00*
U.S. Cl. 73—362 AR **1 Claim**



1. A temperature measuring circuit comprising in combination:

a. an electrical bridge comprising;
1. a temperature responsive resistor and a reference resistor in two of its branches respectively;

2. first and second windings of a transformer in the other two of its branches respectively;

b. means for supplying a voltage input across the junction points between said resistors and said transfer windings;

c. a null detector;

d. means for connecting said null detector to the output of said bridge taken between the junction of said transformer windings and a common connecting point between said temperature responsive and reference resistors;

e. a voltage divider comprising a fixed resistor and a variable resistor;

f. means for supplying a portion of said voltage input across said fixed and said variable resistors;

g. means for connecting said null detector to a junction between said fixed and variable resistors whereby said variable resistor may be adjusted so as to supply voltage to said null detector until the voltage from said bridge has been nullified; and

h. a linear graduation scale associated with said variable resistor having a predetermined temperature indicating scale;

i. the ratio of the supply voltage for said potential divider to the supply voltage of said bridge being such that when balanced there is a linear relationship between the actual temperature change sensed by said temperature responsive resistor and the incremental change of the value of said variable resistor necessary to nullify the voltage from said bridge as determined by said null detector.

4,044,614

THERMOMETER

Paul Beckman, Tarrytown, N.Y., assignor to IPCO Hospital Supply Corporation, White Plains, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,586
Int. Cl.² G01K *1/08, 5/08*
U.S. Cl. 73—371 **12 Claims**

1. A thermometer having a bulb portion and a stem portion comprising:

a. a first layer member enclosing said stem portion of said thermometer, said first layer having an index of refraction sufficiently high to provide visual interpretation of the positional location of an internally contained heat expandable substance in relation to indicia formed on said stem portion, and,

b. a second thermally conductive silicone rubber layer member enclosing said bulb portion of said thermometer, said second layer member being separate and distinct from said first layer member, said first and second layers being joined to form closed contour enclosure for said thermometer throughout an extended length of said thermometer, said first and second layer members being secured to said stem and bulb portion and each of the other for providing contiguous contact of said layers with an outer surface of said thermometer throughout said extended length of said thermometer, said first and second layer member being non-removably secured to said outer surface of said thermometer.

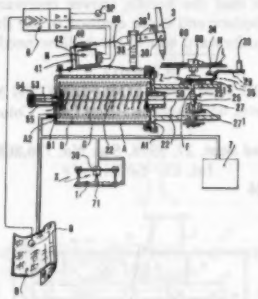
4,044,615

ELECTRIC SPHYGMOMANOMETER

Rino Ghigini, c/o Dr. Ing. Misitano A.G., Via Padova, 217, 20127 Milan, Italy

Filed Dec. 1, 1975, Ser. No. 636,672
Int. Cl.² G01L *19/08, 7/06*
U.S. Cl. 73—391 **1 Claim**

1. In a blood pressure recording device including a manometric bracelet or cuff adapted to encircle a limb of a person: pressure means for applying a pressure to said limb; a rotatable platform for removably supporting a blood pressure recording disc and rotating the disc in response to the value of pressure applied by said pressure means; a writing instrument for writing on said record disc and actuating means for operating said writing means to write on said record disc in response to pulse beats of blood pressure; and means for locating the said record disc with respect to the said rotatable platform, the improvement comprising the provision of a mechanism for rotating the said platform including: a cylindrical bellows having a bottom and a flanged opening; a rigid cup shaped body surrounding the said bellows; a flanged frame rigidly connected with the said cup shaped body and sealing the said flanged opening of the bellows so as to define a sealed chamber in communication with the said cuff; a first screw setting means screwed to said flanged frame; a strong cylindrical spring arranged in the said bellows and compressed between the said bottom of the said



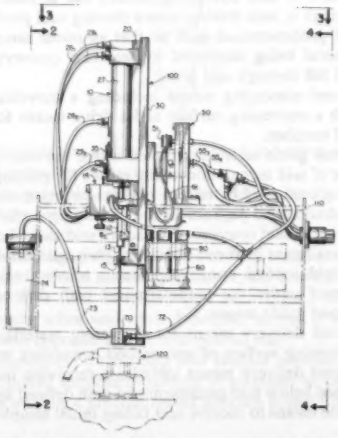
bellows and the said first screw setting means; a rotatable spindle connected to said platform, a conical pulley adjustably connected to the said spindle so as to provide a second setting means; a bush adjustably connected to the said spindle; a wire connected at one end to said bottom of the bellows and at the other end to the said bush whereby the axial deformations of the said bellows body in response to decreasing pressure in the said cuff may be adjustably converted into rotation of the said conical pulley and of the said platform; adjustable elastic means for biasing the said platform in a direction opposite to that caused by the strong cylindrical spring and constituting a third setting means.

4,044,616

AUTOMATIC FLUID INJECTOR

Rano J. Harris, Sr., 1945 Carolyn Sue Drive; Rano J. Harris, Jr., 5443 Stonewall Drive, both of Baton Rouge, La. 70815, and Julius P. Averette, Jr., 4332 Delaware St., Baton Rouge, La. 70805

Continuation-in-part of Ser. No. 618,374, Oct. 1, 1975, Pat. No. 4,000,654. This application Dec. 13, 1976, Ser. No. 749,804
Int. Cl.² G01N *1/12*
U.S. Cl. 73—422 GC **10 Claims**



1. A fluid injector for the measurement and injection of

preselected quantities of a fluid specimen into a media such as an inlet to an analytical instrument which comprises

a barrel,

a hollow needle sealed and slidably mounted within the forward end of said barrel,

a valve located at the rearward end of said barrel for opening and closing said barrel to the flow of the fluid specimen through the barrel and hollow needle,

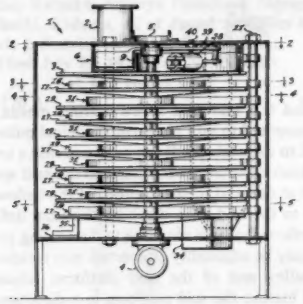
whereby, on opening the valve, the fluid specimen can be flowed through the barrel and needle to purge and clean same and, on closing the valve, a measured amount of the fluid specimen can be trapped inside the barrel and needle, and then injected by relative forward movement of the barrel such that the needle moves rearwardly into the barrel to displace and cause ejection of the fluid specimen through the forward end of the hollow needle.

4,044,617

MULTI-STAGE SAMPLER FOR FLOWING MATERIAL

Flavio J. Mazzetti, 6580 Arequa Ridge Lane, Colorado Springs, Colo. 80919

Filed Sept. 27, 1976, Ser. No. 726,808
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—424 **9 Claims**



1. A multi-stage sampler for providing a representative sample of a flowing stream of material, the multi-stage sampler comprising:

a first conveying means including a movable member with a conveying surface and a drive means for moving said member,

a first delivery means for delivering material onto said conveying surface,

a first guide means positioned above the conveying surface in close proximity thereto for guiding the material being conveyed by said first conveying means along a predetermined path across said conveying surface,

a portion of said conveying surface has at least one hole through it, said driving means moving said portion under said predetermined path so that an initial sample of the material being conveyed by said first conveying means will fall through said hole,

a second conveying means including a movable member with a conveying surface and a drive means for moving said member,

a second guide means positioned above the conveying surface of said second conveying means for guiding material being conveyed by said second conveying means along a predetermined path across the conveying surface thereof,

a portion of said conveying surface of said second conveying means has at least one hole through it, said driving means of said second conveying means moving said portion thereof under the predetermined path defined by said second guide means,

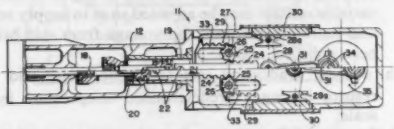
a second delivery means for delivering material onto the conveying surface of said second conveying means, said second delivery means includes a receiving means positioned below said predetermined path defined by said first guide means to receive said falling initial sample whereby an initial sample of the material delivered onto the conveying surface of the first conveying means passes through the hole therein into the receiving means of the second delivery means which delivers the initial sample onto the conveying surface of the second conveying means which passes a sample of the initial sample through the hole therein.

4,044,618

MACHINE DRIVE MECHANISM

Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435

Filed Mar. 15, 1976, Ser. No. 666,697
Int. Cl.[2] F16H *19/04*
U.S. Cl. 74—29 **15 Claims**



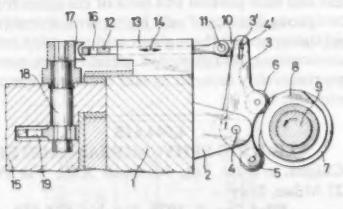
1. A machine drive mechanism for use between a power unit and an energy absorbing unit comprising a counterbalancing and floating rack and pinion mechanism between the units including an axially reciprocable guide means, a pair of spaced and rigidly connected gear racks symmetrically spaced with respect to the axis of said guide means and reciprocable thereon, a double rack member extending between and spaced from said gear racks and reciprocable on said axis, one of said pair of spaced gear racks and double rack member being connected to said guide means so as to permit some lateral movement of the double rack member and spaced gear racks with respect to the axis of said guide means, a pair of gears pivoted on fixed pivots with one each of said gears operably engaging one each of the gear racks on said double rack member and said pair of spaced gear racks for causing said pair of spaced racks and double rack to move in opposite directions and means for connecting one of said pair of spaced gear racks and double rack member to a power source, the masses of the oppositely moving elements of the drive mechanism and the reciprocable elements of the power unit and the energy absorbing unit to be connected thereto being substantially equal.

4,044,619

DEVICE FOR CONTROLLING AUXILIARY MEANS ARRANGED IN THE RECIPROCATING CARRIAGE OF SINGLE OR MULTISTAGE PRESSES

Friedrich-Karl Koch, and Hugo Schneiders, both of Krefeld, Germany, assignors to Peltzer & Ehlers, Krefeld, Germany

Filed June 23, 1975, Ser. No. 589,793
Int. Cl.[2] F16H *25/08*
U.S. Cl. 74—53 **7 Claims**



1. Apparatus comprising a reciprocating carriage (15) having an ejector plunger (20) that travels therewith;

a two-arm lever (18) pivotally mounted on said carriage and movable therewith, one arm of said lever being operably connected to said ejector plunger;

operating means (12) having a flat bearing surface (16, 33) slidably engaging the outer end of the other arm of said lever, said flat bearing surface extending parallel to the

line of travel of said carriage, whereby reciprocating movement of said carriage merely causes said other arm of said lever to slide along said flat bearing surface without rocking said lever on its pivot;

said operating means being movable in the direction perpendicular to said flat surface so as to rock said other arm of said lever about its pivot axis and thereby actuate said ejector plunger and

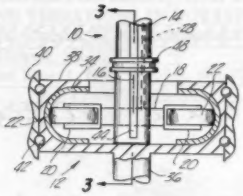
means for periodically moving said operating means.

4,044,620

TRANSMISSION

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 10, 1975, Ser. No. 639,529
Int. Cl.[2] F16H *15/00, 55/34;* F16D *13/22*
U.S. Cl. 74—190 **5 Claims**



1. A variable speed ratio transmission comprising a rotary input mechanism and a rotary output mechanism coaxially aligned for rotation on a single transmission axis;

said output mechanism including an endless annular track centered on the transmission axis; said input mechanism including a rotary shaft on the transmission axis, a cross head extending transverse to the shaft, and a pneumatic tire rotatably mounted at each end of the cross head for planetary orbiting movement around the track surface; the tires and track constituting the drive connected between the input and output mechanisms; said input mechanism futher comprising means carried by the input shaft for rotatably adjusting the cross head around its axis, whereby the tire rotational planes are enabled to take varying angles relative to the track plane.

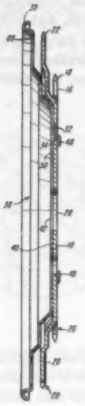
4,044,621

SPROCKET STRUCTURE AND CHAIN GUARD

John C. McGregor, Sr., 252 N. Broadmoor Blvd., Springfield, Ohio 45504; Daniel P. McGregor, 1505 N. Lowry Ave., Springfield, Ohio 45506, and James B. McGregor, 622 Snowhill Blvd., Springfield, Ohio 45504

Filed June 9, 1975, Ser. No. 585,380
Int. Cl.[2] F16H *55/30*
U.S. Cl. 74—243 R **17 Claims**

1. A compound sprocket structure particularly advantageous for use in a bicycle or other vehicle comprising a single plate structure including at least two plate segments each of which has a peripheral edge formed to include a set of teeth, one of said plate segments being offset from the other to provide that said plate segments are arranged thereby to lie in adjacent substantially parallel planes, one of said plate segments being rimmed by and lying within the boundary of the other and the outer of said plate segments having an annular shape, and strip-like plate portions providing connector means joining the respective plate segments, as a continuing part



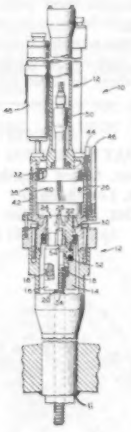
thereof, to rigidly maintain said plate segments in their respective offset substantially parallel planes.

4,044,622

ANTI-EJECTION SYSTEM FOR CONTROL ROD DRIVES

John C. Matthews, 516 E. Allen St., Lancaster, Ohio 43130

Filed Feb. 18, 1975, Ser. No. 550,250
Int. Cl.[2] F16H *1/18*
U.S. Cl. 74—424.8 R **13 Claims**



1. An anti-ejection system for a control rod drive assembly of a nuclear reactor comprising:

a linearly movable control member driven by the control rod drive assembly for positioning a control rod in the nuclear reactor;

latch means engageable with said control member to move with said control member whenever said control member moves in a first direction, said latch means remaining stationary when said control member moves in a second direction opposite said first direction; and

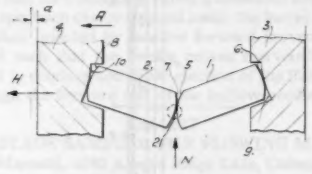
deforming means for binding said control member to prevent further movement thereof in response to said latch means moving a predetermined distance in said first direction.

4,044,623

TOGGLE-LEVER POWER AMPLIFIER

Peter Preisenhammer, Kempten, Germany, assignor to Saurer-Allma GmbH Allgauer Maschinenbau, Kempten, Germany

Continuation of Ser. No. 441,579, Feb. 11, 1974, abandoned.
This application July 16, 1975, Ser. No. 596,574
Claims priority, application Germany, Feb. 19, 1973, 2308175
Int. Cl.[2] G05G 1/04
U.S. Cl. 74—520 15 Claims



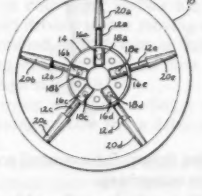
1. A toggle-lever power amplifier comprising a central axis and a plurality of toggle-lever pairs symmetrically and concentrically arranged around said axis, one of whose levers is supported on a stationary abutment means and whose other lever is supported on a movable pressure block means forming the high-pressure part, a low-pressure part having inclined pressure surfaces engaging in each case a counter-pressure surface on one toggle-lever of each of said toggle-lever pairs, said low-pressure part being positioned between these toggle-lever pairs and slidable in the direction of movement of said pressure block means and acting on said counter-pressure surface on said one toggle with a force directed approximately perpendicular to said one toggle, said two toggle-levers of each pair being supported directly on one another and on said stationary abutment means and said pressure block means and all supporting surfaces roll on one another with line contact during the movement of said toggle-lever pairs, each of said supporting surfaces on said toggle-lever pairs which roll on one another having means defining a recess therein and a roller element is loosely received in said recess while maintaining the support between said supporting surfaces which roll on one another.

4,044,624

BOAT STEERING WHEEL

Donald Allen Dekker, Grand Rapids, Mich., assignor to Attwood Corporation, Lowell, Mich.

Filed Oct. 28, 1975, Ser. No. 625,895
Int. Cl.[2] B62D 1/04
U.S. Cl. 74—552 15 Claims



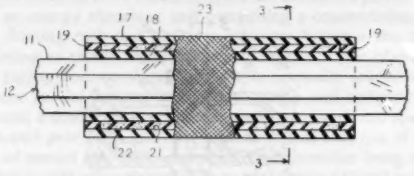
1. A steering wheel comprising:
an annular steering rim;
a central hub having a spoke receiving means and a central axial opening;
a plurality of elongated radial spokes having a first end with rim coupling means and a second end with hub coupling means, each spoke coupled at the first end to the steering rim and at the second end to the spoke receiving means; and
spoke securing means in the central hub, the spoke securing means being a relatively more easily deformed portion of the central hub for engaging the spoke within the spoke receiving means and including a staked projection from the central hub projecting into said spoke receiving means and engaging said hub coupling means of a radial spoke passing through said spoke receiving means thereby securing the radial position of the spoke.

4,044,625

VIBRATION ISOLATING HAND GRIP FOR SHANK OF A PERCUSSIVE CHISEL

Marcel P. D'Haem, New Hartford, and Wallis C. Axt, Holland Patent, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed July 1, 1976, Ser. No. 701,536
Int. Cl.[2] G05G 1/04
U.S. Cl. 74—558.5 7 Claims



1. A sleeve unit adapted to be applied to the shank of a work element of a perspective tool and adapted to be grasped in the palm of a worker's hand during operation of the tool, the sleeve unit comprising an enlongated cylindrical body formed of manually squeezable resilient material, the body having an axially extending through hole adapted to receive slidably the shank of a percussive work element, the body having an elongated annular or closed cavity therein, and fluent material filling the cavity, said body comprising a cylindrical outer sleeve of elastomeric material, a cylindrical inner sleeve of elastomeric material disposed in coaxial relation to the outer sleeve, an annular elastomeric spaced disposed between the sleeves at one end of the unit, a second annular spacer disposed between the sleeves at the opposite end of the unit, the spacers serving the space the outer sleeve radially from the inner sleeve, the spacers defining a closed annular cavity between the sleeves containing the fluent material, the spacers being bonded to the inner and outer sleeves, and the inner sleeves defining the axial through hole.

4,044,626

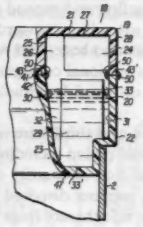
BALANCING RING OF CENTRIFUGAL EXTRACTOR

Gentaro Hayashi, Kanzaki; Kenji Yamamoto, Kusatsu, and Yasakao Yamamoto, Yasu, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Apr. 14, 1976, Ser. No. 676,820
Claims priority, application Japan, Apr. 18, 1975, 50-48851; May 7, 1975, 50-61404[U]
Int. Cl.[2] F16F 15/22; D06F 37/24
U.S. Cl. 74—573 F 7 Claims

1. The combination comprising a spin basket for a cetrifugal type washing machine, said basket having a bottom and a side wall, a hollow balancing ring adapted for containing a liquid attached to said basket side wall, said balancing ring having top

bottom and side walls, and a plurality of partition members projecting from said ring top and bottom walls extending only



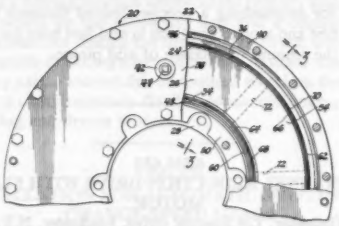
partially into the interior of the ring adapted to modify the flow of liquid in the ring.

4,044,627

VISCOUS DAMPER FOR SMOOTHING TORSIONAL AND BENDING VIBRATIONS IN ROTATING SHAFTS

Robert W. Zander, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1976, Ser. No. 662,325
Int. Cl.[2] F16F *15/10*
U.S. Cl. 74—574 1 Claim



1. A rotary shaft damper for damping torsional and bending vibrations, said damper comprising

a housing having mounting means and defining an internal annular chamber,

a flywheel ring floating freely in said chamber and having oppositely axially facing working surfaces in shear film spaced relation to confronting internal working surfaces of the housing, said ring also having a radially facing surface spaced farther than shear film spacing and sufficiently far from a confronting radially facing surface of the housing to permit substantial lateral movement of said ring within said chamber,

radially yieldable spring means disposed between said radially confronting surfaces and biasing said radially facing ring surface toward a position concentric with said radially facing housing surface and

viscous damping fluid in said chamber in the spaces between the confronting surfaces of the flywheel and housing,

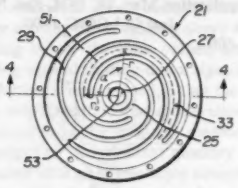
said flywheel ring being movable in said chamber a sufficient amount both angularly and laterally relative to said housing to transmit damping forces to said housing through said viscous fluid and said spring means to oppose both torsional and lateral vibrations of said housing, wherein said radially yieldable spring means comprises a metal spring element annularly disposed between said radially confronting surfaces and having alternately oppositely directed humps resiliently deformed by and engaging said confronting surfaces whereby said surfaces are urged apart.

4,044,628

TORSIONAL DAMPER

Roy T. Jacks, Sterling Heights, Mich., assignor to U.S. Manufacturing Corporation, Fraser, Mich.

Filed Mar. 24, 1976, Ser. No. 670,052
Int. Cl.[2] F16F *15/10*
U.S. Cl. 74—574 9 Claims



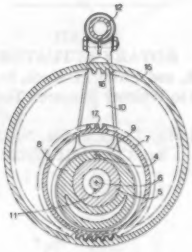
1. A torsional damper for damping out vibrations produced when a shaft is driven by the intermittent application of a discontinuous torque-like force comprising a unitary, integrally cast, disk-like mass having three concentric portions, namely, a first central portion adapted for engaging said driven shaft, a second outer annular ring portion, and an intermediate spring-like portion coupling said inner and outer portions, said spring-like portion including elongated, spirally-arranged, overlapping slots of uniform radial thickness extending axially through said disk and radially between said inner and outer portions to provide spirally-arranged integral web portions adapted to act as torsional shock-absorbing spring means for damping out said vibrations, and wherein for each spiral slot, its radial distances from the spiral center to any point along the web portion centerline is given by the equation $r=r_o+aC$.

4,044,629

RECIPROCATING PISTON MACHINE

John Michael Clarke, Poplars Farm House, Mollington, Banbury, Oxfordshire, England

Filed Dec. 29, 1975, Ser. No. 645,011
Int. Cl.[2] G05G *1/00*; F02B *75/04*
U.S. Cl. 74—579 E 9 Claims



1. A reciprocating piston machine including a cylinder, a piston reciprocatable therein, a crank-shaft, a crank-pin offset laterally from the axis of rotation of said crank-shaft, a connecting-rod pivotally-mounted on said crank-pin and pivotally-connected at the end thereof remote from said crank-pin to said piston, the axis of pivoting of said connecting-rod on said crank-pin offset laterally from the longitudinal axis of said crank-pin, and means constraining the axis of pivoting of said connecting-rod on said crank-pin to follow a predetermined locus as said crank-shaft is rotated, said constraining means comprising a non-rotatable gear mounted co-axially of the crank-shaft axis of rotation and a rotatable gear wheel mounted co-axially on said crank-pin for rotation thereon and in mesh with said non-rotatable gear, said connecting-rod mounted on

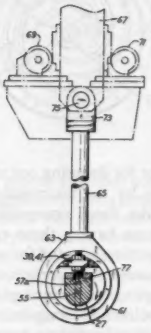
said rotatable gear to pivot about an axis offset laterally from the longitudinal axis of said crank-pin.

4,044,630

ADJUSTABLE ECCENTRIC

Donald N. Adams, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 535,835, Dec. 23, 1974, abandoned.
This application Mar. 18, 1976, Ser. No. 668,214
Int. Cl.[2] G05G *1/00*
U.S. Cl. 74—600 **3 Claims**



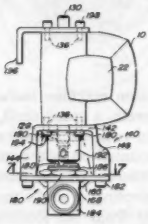
1. Apparatus that oscillates the casting mold of a continuous casting machine, wherein the improvement comprises:
a. a shaft journaled for rotation about a horizontal axis;
b. means for rotating said shaft;
c. a D-shaped protrusion on said shaft;
d. a hub having an aperture within which said D-shaped protrusion is disposed in slidable contact therewith;
e. a housing intimately surrounding said hub and secured to means connected to said mold for actuating said mold;
f. means disposed in said aperture and coacting with said hub and said protrusion for maintaining said hub and said protrusion in intimate contact and in preselected relative positions; and
g. means including a shim for variably positioning said hub relative to said protrusion.

4,044,631

ROTARY ACTUATOR

Stephen Matousek, and Ulrich H. Koch, both of Chagrin Falls, Ohio, assignors to Whitney Research Tool Company, Emeryville, Calif.

Filed May 21, 1975, Ser. No. 579,467
Int. Cl.[2] F16H *57/02*
U.S. Cl. 74—606 R **21 Claims**



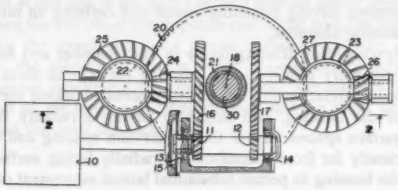
1. A rotary actuator comprising in combination:
a unitary housing having first and second cylindrical bores communicating with each other in an end to end relationship with at least the end of said first bore spaced from said second bore being open, said housing further including an open ended third bore communicating with and extending generally normal to said second bore;
a piston closely received in said first bore and selectively movable between first and second positions therein;
an elongated rack extending outwardly of one face of said piston into said second bore, said rack having a generally rectangular cross sectional configuration with the teeth of said rack being disposed longitudinally along the upper surface thereof;
a pinion disposed in said third bore in operative association with said rack, said pinion including an elongated operating member extending outwardly of said third bore;
a separate bushing member disposed in said second bore at least on the other side thereof from the operative interconnection between said rack and pinion for guiding and supporting said rack, said bushing member extending along at least a longitudinal portion of said second bore and including an outer wall configuration closely received in said second bore, said bushing member further including a longitudinally extending groove having the same cross sectional configuration as said rack and dimensioned to receive the bottom wall surface and a portion of the side wall surface of at least a portion of said rack in a sliding relationship therein;
means for closing the open end of said first bore;
means for selectively forcing said piston between said first and second positions to effect rotary movement of said pinion and operating member through linear movement of said rack in operative engagement with said pinion; and,
means for establishing a precise desired distance between said first and second positions in said first bore for controlling the amount of rotation of said pinion.

4,044,632

TWIN CHANNEL REDUCTION DRIVE WITH ELECTRIC MOTOR

Ernest Wildhaber, 124 Summit Drive, Rochester, N.Y. 14620

Filed May 9, 1975, Ser. No. 576,103
Int. Cl.[2] F16H *37/06, 57/00*
U.S. Cl. 74—665 G **4 Claims**

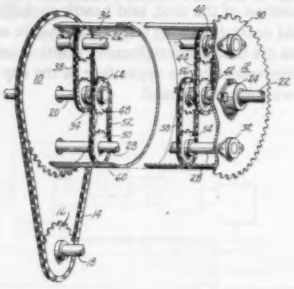


1. A reduction drive comprising
an electric motor,
two axially spaced cylindrical pinions coaxial with the motor and rigid with each other,
said pinions contain helical teeth of equal lead and opposite hand and are rotatably mounted for axial self-adjustment to equalize their loads,
said pinions mesh with two coaxial cylindrical gears respectively whose axis is parallel to the pinion axis,
a rotating power consumer having a plurality of working parts spaced about its axis of rotation,
a final drive gear forming part of said power consumer,
two pinions meshing with said final drive gear and being spaced about the axis of the drive gear,
each of the last-named pinions being operatively connected with one of said cylindrical gears.

4,044,633
DIFFERENTIAL DRIVES INCLUDING FLEXIBLE INTERCONNECTING DRIVE ELEMENTS

Robert W. Lee, 5 Rockwood St., Walpole, Mass. 02081

Filed Feb. 25, 1976, Ser. No. 661,393
Int. Cl.[2] F16H *3/44, 1/28, 9/00*
U.S. Cl. 74—750 R 10 Claims

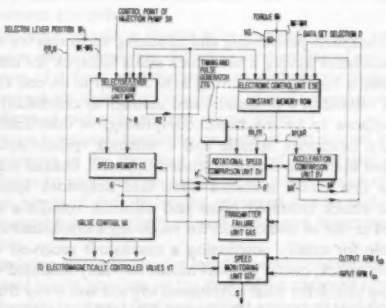


1. A differential planetary drive assembly comprising means defining a primary axis, means defining a secondary axis, a rotatable external planetary carrier journalled about the primary axis for supporting the secondary axis for movement about the primary axis, a power path comprising a first couple including a driving toothed wheel on the primary axis, a driven toothed wheel on the secondary axis and a complementary flexible connector linking the driving and driven wheels and a second couple including a second driving toothed wheel on the secondary axis, a second driven toothed wheel on the primary axis and a complementary flexible connector linking the second driving and driven wheels.

4,044,634
INSTALLATION FOR AUTOMATIC SHIFTING OF CHANGE-SPEED GEARS

Hans-Jörg Florus, Goppingen; Horst Grossner, Geradstetten, and Günter Weiger, Zell, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed July 26, 1974, Ser. No. 492,145
Claims priority, application Germany, July 27, 1973, 2338122
Int. Cl.[2] B60K *21/00*
U.S. Cl. 74—866 64 Claims

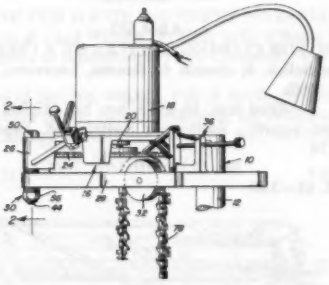


1. An installation for the automatic shifting of change-speed transmissions which includes actuating means for the engagement and disengagement of the speeds, the actuating means being controllable by way of control means by at least two influencing magnitudes, characterized in that an electronic control unit having a programmable constant memory means is provided, in which is stored at least one set of output rotational speed limit values coordinated to the individual speeds and torque steps, means for applying to the electronic control unit by way of corresponding inputs at least the influencing magnitudes of torque and engaged speed, said constant memory means including an output operatively connected with a rotational speed comparison means in which the driven rotational speed limit values produced by the constant memory means are compared with the respective output rotational speed of the transmission, said rotational speed comparison means being operable to trigger shifting-up or shifting-down signals, when exceeding or falling below the limit values, and means for applying the shifting-up and shifting-down signals to the actuating means, and further characterized in that the transmission has a transmission output shaft, in that acceleration limit values are additionally storable in the constant memory means for each speed, the output of the constant memory means being operatively connected with an acceleration comparison means, in which the acceleration limit values produced by the constant memory means are compared with the prevailing acceleration of the output shaft of the transmission, said acceleration comparison means being operable to produce signals when exceeding and falling below the limit values which are fed as a further influencing magnitude to the electronic control unit, and in that output rotational speed limit values are additionally storable in the constant memory means which, in addition to torque and engaged speed, are coordinated to the acceleration signals.

4,044,635
SAW CHAIN SHARPENER

Jack F. Simington, Box 141, Star Rte., Chiloquin, Oreg. 97624

Continuation-in-part of Ser. No. 516,129, Oct. 18, 1974. This application June 18, 1976, Ser. No. 697,745
Int. Cl.[2] B23B *63/16*
U.S. Cl. 76—42 7 Claims

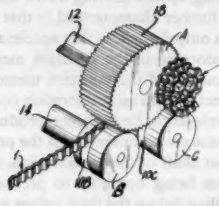


7. In combination, a mount, a drivable rotary grinding wheel journaled from said mount, a support, a disc, mounting means mounting said disc on said support for angular adjustment relative to said support about a first axis passing centrally through said disc, support means mounting said support from said mount for swinging about an axis generally normal to said first axis and generally paralleling the axis of rotation of the rotary grinding wheel, the outer periphery of said disc including peripherally continuously extending groove sections formed therein of slightly different predetermined width for snugly slidably receiving chain tooth guide lugs of different thicknesses, said groove sections each extending generally 180° about said disc and being of constant width.

4,044,636
METHOD AND APPARATUS FOR FORMING A HELICAL CUTTER STRIP FOR A DRY SHAVER ASSEMBLY

Alojzy Antoni Kolodziej, Stobhill, Northcumberland, England, assignor to Ronson Corporation, Woodbridge, N.J.

Continuation-in-part of Ser. No. 455,535, March 28, 1974, Pat. No. 3,927,581. This application Nov. 25, 1975, Ser. No. 635,093
Claims priority, application United Kingdom, Apr. 2, 1973, 15759/73
Int. Cl.[2] B21K *11/00*; B21D *11/08*
U.S. Cl. 76—104 R 5 Claims

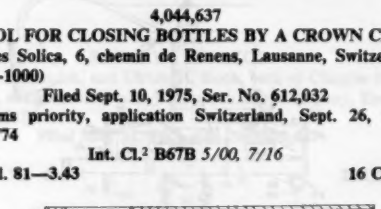


5. A method for winding into a helical configuration an elongated cutter strip for the cutter unit of a dry shaver assembly having undulations extending along the length thereof comprising the steps of passing said elongated cutter strip in an edgewise position through a roller triad including a main roller and a pair of auxiliary rollers mounted for rotation about parallel axes, said auxiliary rollers each having a diameter smaller than the diameter of the main roller and arranged relative to said main roller to circumferentially receive said strip between said main roller and each of said auxiliary rollers, with passage of said undulated strip in said edgewise position circumferentially about said main roller between said main roller and each of said auxiliary rollers operating to form said strip in said helical configuration, said elongated cutter strip being first passed between said main roller and one of said auxiliary rollers and being subsequently passed between said main roller and the other of said auxiliary rollers with said main roller and said auxiliary rollers being configured such that they impart to said strip as it is passed therebetween a directional component of travel extending obliquely to said parallel axes.

4,044,637
TOOL FOR CLOSING BOTTLES BY A CROWN CAP

Georges Solica, 6, chemin de Renens, Lausanne, Switzerland (CH-1000)

Filed Sept. 10, 1975, Ser. No. 612,032
Claims priority, application Switzerland, Sept. 26, 1974, 13012/74
Int. Cl.[2] B67B *5/00, 7/16*
U.S. Cl. 81—3.43 16 Claims

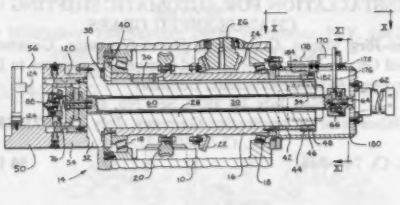


1. A tool for closing bottles with a crown cap, said tool including a handle, tightening means carried by said handle for tightening the crown cap on the neck of the bottle to close the latter, said tightening means comprising an expansible split ring for surrounding said cap, means associated with said handle and with said split ring for causing the latter to contract in response to a certain force applied to said handle so as to tighten the cap about the bottle neck, said split ring defining a plane and said handle defining a lengthwise direction, said means for causing said split ring to contract including pivot means for said handle to permit the latter to pivot about an axis substantially parallel to said plane of said split ring and perpendicular to said lengthwise direction of said handle, cam means associated with said handle for contracting said split ring when said certain force is applied to said handle to cause the latter to turn on said axis, said split ring including an upper lip, as seen in the normal working position of the tool, for supporting the tool on the upper face of the cap of the capped bottle , said split ring having an upper central opening, as seen in the normal working position of the tool, said handle including a nose for entering said central opening when said handle and said tightening means are in said nontightening position and for causing a tell-tale depression in the upper face of the cap to show that the bottle was already opened.

4,044,638
CRANKSHAFT MACHINE STOCK AND CHUCK APPARATUS

Allan J. Heffron, Freeland, and Leverne H. Kennedy, Saginaw, both of Mich., assignors to Crankshaft Machine Company, Jackson and C. M. Systems, Incorporated, Bay City, both of Mich.

Continuation of Ser. No. 519,501, Oct. 31, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,317
Int. Cl.[2] B23B *5/18*
U.S. Cl. 82—9 8 Claims



1. Crankshaft positioning and chucking apparatus for crankshaft machines having a headstock and a tailstock for use with crankshafts having a centering hole defined in an end thereof axially related in a predetermined manner to crankshaft bearing surfaces to be machined comprising, in combination, a frame, a headstock spindle and a tailstock spindle rotatably mounted upon said frame in spaced opposed, coaxial relationship, a first chuck mounted upon said headstock spindle, a second chuck mounted upon said tailstock spindle a center located in one of said chucks for receiving a crankshaft centering hole for axially positioning a crankshaft received within said one chuck, center support means movably mounted within said one chuck for axial adjustment toward and away from the other chuck between a loading and unloading position and a machining position fixedly supporting said center, positioning means axially fixedly positioning said center support means at said machining position, crankshaft biasing means located in said other chuck biasing a crankshaft received therein toward said center, crankshaft holding means defined on each of said chucks, and actuating means associated with each spindle operatively connected to the associated holding means for selective actuation thereof.

4,044,639

SYSTEM FOR CUTTING PIECES FROM A TRAVELING STRIP OF SHEET MATERIAL

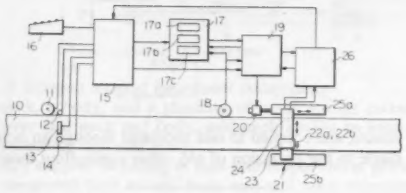
Tetsuji Kato, Otake, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 533,182, Dec. 16, 1974, which is a division of Ser. No. 434,065, Jan. 17, 1974, Pat. No. 3,892,153. This application June 12, 1975, Ser. No. 586,367

Claims priority, application Japan, Jan. 18, 1973, 48-8169; Jan. 18, 1973, 48-8170

Int. Cl. B26D *3/08, 5/00*

U.S. Cl. 83—7 1 Claim



1. A method for obtaining at least two collections of sheets respectively of relatively longer and shorter lengths, by transversely severing a polymerized and continuously traveling plastic strip which leaves one end of a polymerizing interspace defined by confronting belt working lengths of a pair of upper and lower endless belts having specified weld lines and known defects formed on the surface of said upper and lower belts, said belts being disposed to run continuously at the same speed in the same direction, the other end of the polymerizing interspace being continuously fed with an unhardened plastic raw material to be polymerized at an appropriate temperature condition, said plastic strip having usable longitudinally extending portions from which a plurality of sheets of either of said longer and shorter lengths may be severed, said portions being such terminated at least at one end by one of a plurality of defects including a first group of defects which occur, according to expectation, in the polymerized plastic sheet due to the cause of said weld lines and known defects of said endless belts, and a second group of defects which occur, contrary to expectation, in the polymerized plastic sheet during polymerizing said plastic sheet due to diverse known causes, wherein the improvement comprises:

passing said traveling plastic strip through a first pickup means for successively detecting occurrence of said first group of defects, and through a second pickup means for successively detecting occurrence of said second group of defects of said polymerized plastic strip;

obtaining position information on each of said second group of defects in the traveling direction of said plastic strip, relative to position information of an adjacent one of said first group of defects having occurred due to said weld lines and known defects of said upper and lower endless belts;

determining successively the lengths of successive portions of said usable portions on the basis of the obtained position information of said first and second groups of said defects in said polymerized plastic strip;

calculating a ratio of number of sheet pieces of said longer and shorter lengths for obtaining an entire combined length which is closest to but shorter than the length of each said usable portion, and;

severing each of said usable portions into the longer and shorter lengths in accordance with the calculated numbers ratio.

4,044,640

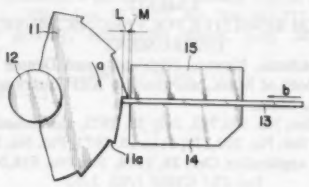
METHOD OF MAKING REINFORCEMENTS FOR CONCRETE

Isao Gokyu, Musashino, Japan, assignor to Nippon Concrete Industries Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1975, Ser. No. 630,629

Int. Cl.² B26D *3/00, 5/20*

U.S. Cl. 83—42 4 Claims



1. Method of making reinforcements for concrete from a band material of a steel plate, said reinforcements having preferred dimensions, comprising the steps of:

rotating a cutter wheel about is rotational axis, said cutter wheel width being in excess of the width of said band material, said cutter wheel including a number of cutting edges extending inwardly from its outer periphery, the height of said edges being in the range of 0.2 to 0.5 mm. from a root to said outer periphery, said edges being aligned parallel to said rotational axis of said cutter wheel;

supporting said band of material on a planar surface adjacent said rotating cutter wheel, the spacing between said surface and said cutting edge being about 0.05 mm., said planar surface being parallel to said rotational axis;

feeding said band of material to said rotating cutter wheel until the forward end of said material contacts said cutter wheel at said root of said cutting edge, the thickness of said band being approximately equal to the height of said cutting edge, the width of said band being 10 to 50 mm.;

shearing said band of material by contact of one of said cutting edges, whereby a superior reinforcement for concrete is formed.

4,044,641

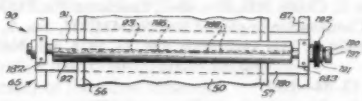
MACHINE FOR HANDLING SHEET MATERIAL

George A. Burt, Jr., and William M. Neill, both of Santa Clara, Calif., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 546,602, Feb. 3, 1975, abandoned, which is a division of Ser. No. 388,813, Aug. 16, 1973, Pat. No. 3,888,395. This application Sept. 21, 1976, Ser. No. 725,328

Int. Cl.² B26D *1/56*

U.S. Cl. 83—341 7 Claims



1. In a machine for handling sheet material in combination:

a source of flexiable sheet material;

means for receiving a web of material from said source and directing the same along a feed path;

a cutting mechanism positioned along the feed path for dividing the web into successive sheets, the cutting mechanism having a pair of rollers and cutting means carried by only one of the rollers, the rollers being skewed relative to each other and being angularly disposed with respect to a direction transverse to the direction of movement of the web along said feed path to provide point contact between

the cutting means and the other roller, the cutting means being angularly disposed with respect to said transverse direction, being parallel to the axis of rotation of said other roller and severing the web along a straight line which extends in a direction transverse to said direction of movement; and

drive means for advancing the web between said rollers.

4,044,642

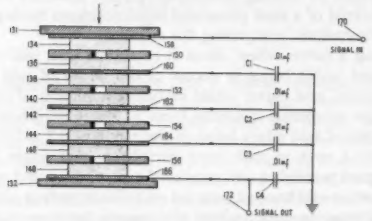
TOUCH SENSITIVE POLYPHONIC MUSICAL INSTRUMENT

Alan R. Pearlman, Newton Highlands, and Dennis P. Colin, Beverly, both of Mass., assignors to ARP Instruments, Inc., Lexington, Mass.

Division of Ser. No. 381,783, July 23, 1973, abandoned, which is a division of Ser. No. 263,178, June 15, 1972, Pat. No. 3,784,935. This application Oct. 29, 1974, Ser. No. 518,347

Int. Cl.[2] G10H *1/02, 5/02*

U.S. Cl. 84—1.1 **19 Claims**



1. In an electronic music system having at least one waveform oscillator, and a control voltage source, a touch responsive assembly composed of a plurality of stacked touch responsive devices comprising;

a touch responsive filter network, coupled from the waveform oscillator and having conductance means variable continuously over at least a portion of a selected conductance range in accordance with pressure applied to said stack over a range including a range corresponding to said selected conductance range,

and a touch responsive control network coupled from the voltage source and having conductance means variable continuously over at least a portion of a selected conductance range in accordance with pressure applied to said stack over a range including a range corresponding to said selected conductance range.

4,044,643

MUSICAL INSTRUMENT CIRCUIT PROVIDING CELESTE AND VIBRATO EFFECTS

Willis E. Chase, P.O. Box 4042, Lancaster, Pa. 93534

Continuation-in-part of Ser. No. 431,937, Jan. 9, 1974, abandoned. This application Apr. 23, 1975, Ser. No. 570,650

Int. Cl.[2] G10H *1/02, 5/02*

U.S. Cl. 84—1.24 **9 Claims**

1. An electronic circuit for a musical instrument comprising:

a keying circuit for generating a keying voltage;

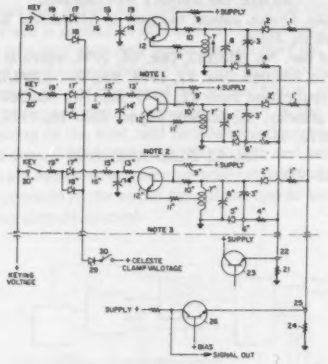
an oscillator made operative by application of said keying voltage thereto;

control means coupling said keying circuit to said oscillator whereby said keying voltage applied to said oscillator is controlled;

frequency modulation means coupled to said oscillator whereby the frequency of oscillation is modified in response to the magnitude of said keying voltage;

said keying circuit consists of a first keying means for generating a keying voltage of high magnitude for normal effects, and coupled directly to said oscillator; and

a second keying means for generating a keying voltage of lower magnitude than said high magnitude for celeste



effects, and coupled to said oscillator through an isolation diode to the exclusion of any other controlling means.

4,044,644

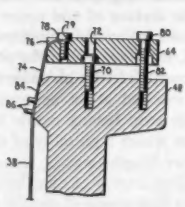
PIANO

Charles E. Mussulman, 2 E. Main, Chanute, Kans. 66720

Division of Ser. No. 477,295, June 7, 1974, Pat. No. 3,923,939. This application Oct. 28, 1975, Ser. No. 626,217

Int. Cl.[2] G10C *3/10*

U.S. Cl. 84—207 **3 Claims**



1. In a stringed instrument where a plurality of strings under tension are employed having predetermined frequencies of vibration, and where frame means supports one end of each string and is provided with apparatus for adjusting the tension, the improvment in said apparatus comprising:

a plurality of tuning bars each having a pair of opposed ends;

means attaching said end of each string to one end of a corresponding bar;

a base provided with means supporting said bars intermediate their ends for rocking movement of each bar in directions to respectively decrease and increase the tension on the corresponding string; and

selectively adjustable elements engaging the opposite ends of respective bars and secured to said base for independently holding each bar against movement under the force of the attached string and permitting adjustment of the bar to a position that will set the string at the predetermined frequency,

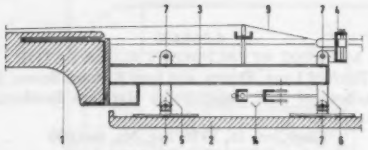
each element and said base having mating thread means providing a fine adjustment of the tension of each string upon rotation of the corresponding element,

said supporting means comprising selectively adjustable components engaging respective bars and providing a fulcrum for each bar, each of said components and said base having mating thread means providing a relatively coarse adjustment of the tension of each string upon rotation of the corresponding component.

4,044,645
DEVICE FOR CONTINOUS PITCH VARIATION OF STRINGED INSTRUMENTS

Rainer Franzmann, Mittelstrasse 24, 2000 Norderstedt 2, Germany

Filed Sept. 16, 1975, Ser. No. 613,803
Claims priority, application Germany, Nov. 21, 1974, 2445181; Feb. 20, 1975, 2507285
Int. Cl.² G10D 3/00
U.S. Cl. 84—313 6 Claims

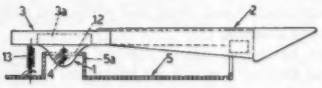


1. A stringed musical instrument comprising:
a neck, a body, and a plurality of tuned strings extending over said neck and body, said neck having an extension extending into said body;
rotary support including at least one support lever pivotally connected both to said body and said neck extension to rotate about a body rotation axis and a neck extension rotation axis, respectively, said rotary support means being so arranged that said neck extension may move longitudinally relative to said body to rotate said support lever;
string holder means firmly mounted on said support lever for holding one end of said strings, said string holder means rotating with said support lever about said neck extension rotation axis to vary the tension of said strings; and
compensating means connected to said neck extension and said support lever for zeroing the torque on said support lever created by the tension of said tuned strings.

4,044,646
SUPPORTING AND PIVOT DEVICE MADE OF PLASTIC FOR KEYS OF PIANOS, ELECTRONIC ORGANS AND THE LIKE

Carlo Invernati, Sirolo, Italy, assignor to Danyel S.A.S., Sirola (Ancona), Italy

Filed Mar. 26, 1976, Ser. No. 670,982
Claims priority, application Italy, Apr. 1, 1975, 609/75
Int. Cl.² G10C 3/12
U.S. Cl. 84—435 5 Claims

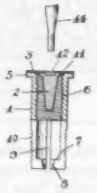


1. A supporting and pivot device to be connected to the lever carrying a key of keyboard of a piano, electronic organ or the like, to be pivotally connected with a transverse pivot pin or rod supported by the stationary frame of said keyboard and where the key is associated with a return spring, characterized by the fact that the device comprises a body made of plastic having a sufficient strength and capable of a slight elastic deformation, said body being shaped substantially as a wedge having an upper flat surface designed to be connected with said lever, and curved front and rear surface portions which merge at their respective lower portion, one of the curved rear surface portions of said body includes a first transverse slot extending upwardly and inwardly where it terminates at a central cylindrical hole, the axis of said hole being parallel to the axis of the pivot pin and having substantially the same diameter as that of said pin, said slot having a width slightly smaller than the diameter of said pin, a second slot which is adjacent to and parallel with said first named slot which cooperates with said first slot to increase the elastic deformability of one of the side walls of said first slot when said pivot pin is received into said first slot where it is secured within said hole associated with said first slot.

4,044,647
SPREADABLE ANCHOR ASSEMBLY

Kenryu Takahashi, 3-go, 22-ban, 1-chome, Tokyo, Japan

Filed Jan. 15, 1975, Ser. No. 541,212
Claims priority, application Japan, Aug. 28, 1974, 49-102236[U]
Int. Cl.² F16B 13/10
U.S. Cl. 85—72 8 Claims



1. A spreadable anchor assembly, adapted to be fixed to an opening of a wall or the like, comprising an elongated tubular sleeve having opposed open ends and being formed with inner threads at the region of one of said open ends while being formed with longitudinally extending slits extending along said sleeve from the other of the open ends thereof to define spreadable legs between said slits, said sleeve being formed with an inner tapered opening at the region of said spreadable legs thereof and having adhered to said one open end in a position extending across and closing said one open end of said sleeve a cap of easily ruptured sheet material which has an inner surface directed toward the other open end of said sleeve, and an elongated tapered spreader element adhered to said cap at said inner surface thereof and situated in the interior of said sleeve, so that a punch may be applied to said cap to rupture the latter while driving said spreader element into the inner tapered opening of said sleeve to spread said legs thereof outwardly into engagement with the surface of an opening which is formed in a wall or the like for anchoring said sleeve thereto, the rupturing of said cap and the driving of said spreader element into the tapered opening to spread said legs uncovering the inner threads so that a screw may be received therein.

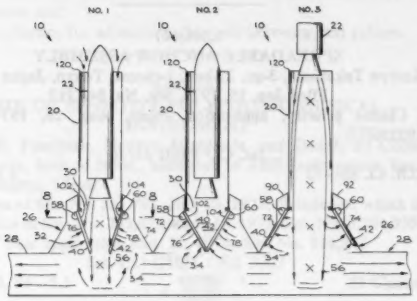
4,044,648
ROCKET EXHAUST PLENUM FLOW CONTROL APPARATUS

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Sept. 29, 1975, Ser. No. 617,337
Int. Cl.² F41F 3/04
U.S. Cl. 89—1.8 30 Claims

1. Controlled fluid flow apparatus comprising:
a. a plurality of fluid flow elements;
b. a common manifold;
c. means for connecting said elements to said manifold in fluid exchange relationship, said connecting means including a plurality of transition sections adapted for separately directing pressurized fluid from said elements into said manifold; and
d. means for controlling the flow of pressurized fluid through said transition sections, said controlling means including a plurality of pairs of flow control doors and means for pivotably hanging the doors in opposing relationship by pairs in corresponding portions of the transition sections, said doors of each of said pairs being configured to hang, under the action of gravity alone, at least

slightly inclined toward one another and being operative to pivot to a fully closed position in response to back pressure in the associated transition section when pressurized fluid is flowing through any non-associated transition



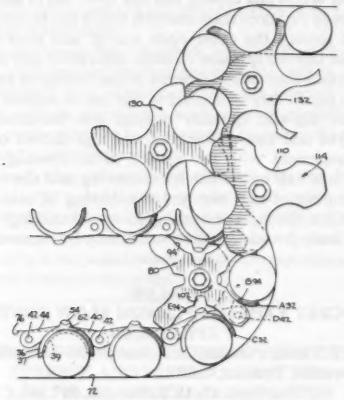
section into the manifold, and being operative to pivot to just that degree of openness required to prevent fluid backflow when pressurized fluid is flowing through the associated transition section into the manifold.

4,044,649

CONVEYOR MECHANISM

Frank A. Wilder, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Sept. 17, 1973, Ser. No. 397,846
Int. Cl.[2] F41D 9/02
U.S. Cl. 89—33 BB **6 Claims**



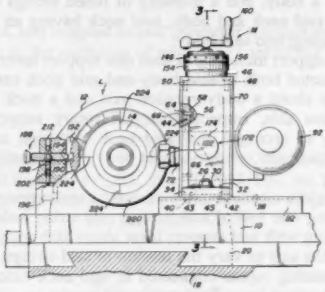
1. A conveyor system comprising:
a sprocket; and
a chain of conveyor elements;
each of said conveyor elements having a body portion including:
a convex cylindrical surface having a first radius defining a longitudinal axis,
a projecting leading rigid arm having a distal first portion of a pivot means,
a projecting trailing rigid arm having a distal second portion of a pivot means for coupling with the first portion of a pivot means of the leading arm of the next succeeding element said arms having a mode of operation such that immediately adjacent arms mutually pivot about a common axis;
said sprocket including:
a hub having a longitudinal axis,
a pair of spaced apart plates fixed on said hub and having a plurality of pairs of longitudinally aligned concave recesses therein congruent with and for seating the convex surface of a respective element body portion,
said hub having a like plurality of surfaces, one adjacent each of said pairs of sprocket concave recesses, for underlying and abuting the leading and trailing arms of a respective element when its body portion is seated in a respective pair of sprocket concave recesses.

4,044,650

MILLING ATTACHMENT FOR A LATHE

Garnet Rexford Lyon, Elmira, and Ivan Richard Brown, Horseheads, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jan. 16, 1976, Ser. No. 649,800
Int. Cl.[2] B23C 7/02; B23B 3/36
U.S. Cl. 90—14 **15 Claims**



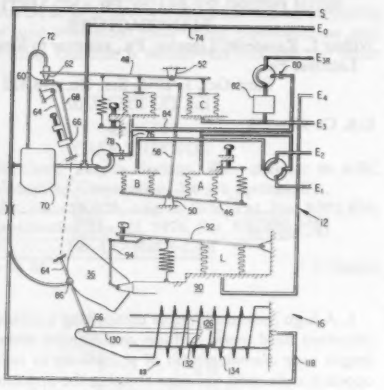
1. In combination with a lathe including a headstock, a lathe spindle assembly received within said stock, a carriage and a cross-slide; a milling attachment comprising:
a base secured to said cross-slide,
a vertical support column attached to said base and including a first interlocking element,
a block having a second interlocking element in interfitting engagement with said first element and movable relative thereto in the vertical direction,
a tool carrying spindle rotatably received in said block and extending horizontally along one side of said supporting column in a first direction,
a motor mounted to said block and positioned adjacent said supporting column,
said motor having an axis of rotation and an output shaft collinear therewith which are horizontal and extend perpendicularly to said first direction,
gear means operatively connected between said motor output shaft and said spindle for rotating said spindle,
vertical adjusting means associated with said supporting column means raising and lowering said block,
locking means passing through said first and second interlocking elements clamping said second element to said first element to lock said block at a selected vertical position,
an electric drive motor driving said lathe spindle assembly, and
three position lock switch means associated with said headstock mechanically locking said lathe spindle assembly against rotation and electrically disabling said drive motor when in its first position, mechanically releasing said spindle assembly and electrically enabling said drive motor when in its second position, and mechanically releasing said spindle assembly and disabling said drive motor when in its third position.

4,044,651

PNEUMATIC FUNCTION GENERATOR ASSEMBLY

James C. Warrick, Euclid, Ohio, assignor to Bailey Meter Company, Wickliffe, Ohio

Continuation of Ser. No. 576,904, May 12, 1975, abandoned. This application Sept. 7, 1976, Ser. No. 720,911
Int. Cl.[2] F15B *13/16;* F01B *31/00*
U.S. Cl. 91—47 5 Claims



1. A motion balance servomechanism for a function generator comprising:

nozzle means for providing different backpressure signals in relation to restrictions of fluid therethrough;

flexible restriction means having a plane surface mounted proximate to said nozzle means to restrict fluid flow through said nozzle means; and

a guide member connected to said nozzle to be located directly opposite said nozzle but spaced therefrom to allow the plane surface of said flexible restriction means to move between said nozzle and said guide member, said guide member having an opening extending therethrough which is always aligned with said nozzle,

motion means for moving said nozzle means with respect to said restriction means from a position along the plane surface to a position along an edge of the plane surface of said flexible restriction means allowing substantially unrestricted fluid flow through said nozzle means, said motion means including a piston assembly having a movable piston and being connected to said nozzle means to provide different piston positions in response to different backpressure signals from said nozzle means, said piston assembly including a cylinder having one end sealably connected to said nozzle means to sense the backpressure signal therefrom and the opposite end open to ambient, a piston sealably movable within said cylinder in response to the backpressure signal from said nozzle means and flexible tubing extending partially over the open end of said cylinder to prevent said piston from moving out of said cylinder.

4,044,652

ELECTROHYDRAULIC PROPORTIONAL ACTUATOR APPARATUS

Leon David Lewis, Palos Verdes; Wilfried Wiher, Redondo Beach, and Warde L. Parker, Rancho Palos Verdes, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 12, 1975, Ser. No. 576,611
Int. Cl.[2] F15B *9/10, 13/044*
U.S. Cl. 91—368 10 Claims

1. Electrohydraulic proportional actuator apparatus comprising:

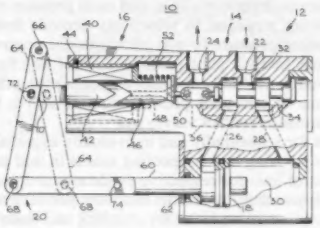
a housing;

a double-acting fluid-responsive motive member having an output shaft coupled for movement therewith;

means for admitting pressurized fluid to develop a differential pressure across said motive member, said means including a valve movable between a null position and respective flow positions for applying pressure to one side or the other of said motive member;

a solenoid coupled to drive said valve to a selected flow position corresponding to an incremental change of current level in the solenoid; and

means responsive to the movement of the motive member for restoring the valve to its null position upon the motive



member reaching a position corresponding to the level of current in the solenoid;

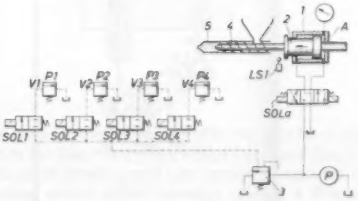
wherein said valve comprises a spool valve having a spool member translatable along an axis within a valve chamber; wherein the solenoid comprises a support frame mounting an integral coil and core adapted for translatable movement along the translation axis of said spool member, and a plunger connected to the spool member; and wherein the movement-responsive means comprises a link pivotably anchored to the housing and pivotably connected respectively to said motive member and to said solenoid frame to cause translation of the coil and core in proportion to the movement of the motive member.

4,044,653

HYDRAULIC CONTROL APPARATUS FOR INJECTION MOLDING FLUENT PLASTIC MATERIAL

Katashi Aoki, Sakaki, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Japan

Division of Ser. No. 414,655, Nov. 12, 1972, abandoned. This application Sept. 9, 1975, Ser. No. 611,802
Claims priority, application Japan, Nov. 17, 1972, 47-114830
Int. Cl.[2] F15B *15/20*
U.S. Cl. 91—392 6 Claims



1. Hydraulic control apparatus for controlling the injection speed and pressure of an injection molding machine having a hydraulic cylinder with a piston therein coupled to an injection molding nozzle, said apparatus comprising:

a source of hydraulic fluid;

a hydraulic fluid pump;

a main hydraulic circuit comprising:

a main line connected to said hydraulic cylinder, said

pump being arranged to provide hydraulic fluid under pressure from said fluid source to said main line; and

valve means in said main line between said pump and said hydraulic cylinder for controlling the application of hydraulic fluid to said cylinder for selective actuation of said piston in either direction;

a pilot hydraulic circuit for controlling the pressure in said main line, said pilot circuit comprising:

a plurality of pilot pressure control valves each having a pressure set point;

a like plurality of pilot pressure control lines respectively connecting said pilot pressure control valves in parallel;

a main pressure control valve, said parallel pilot pressure control lines being connected to said main line between said pump and said valve means through said main pressure control valve, said main pressure control valve being arranged to selectively provide hydraulic fluid under pressure to said pilot pressure control lines; and

means in each pilot pressure control line for selectively and individually isolating and connecting the respective one of said pilot pressure control valves to said main pressure control valve; and

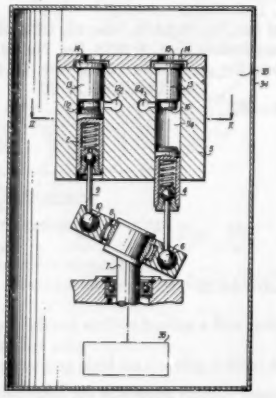
means for sequentially and individually actuating said selective isolating and connecting means in said pilot pressure control lines for respective predetermined periods of time to sequentially adjust the main line pressure to the respective pressure set points by coupling said main line individually to said pilot pressure control valves through said main pressure control valve and through a respective isolating and connecting means, only one of each of said pilot pressure control valves and its respective pilot pressure control line and isolating and connecting means being coupled through said main pressure control valve to said main line at any one time, whereby the pressure within said hydraulic cylinder and the speed of movement of said piston therein is controlled.

4,044,654

HYDRAULIC ENGINE

Marcel F. Guillon, Issy-les-Moulineaux, France, assignor to D. B. A., Clichy, France

Continuation-in-part of Ser. No. 558,559, March 14, 1975, abandoned. This application July 1, 1976, Ser. No. 701,579
Claims priority, application France, Mar. 27, 1974, 74.10489
Int. Cl.² F01B *13/04*
U.S. Cl. 91—499 **3 Claims**



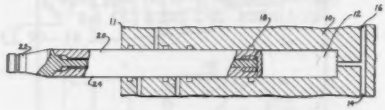
1. A hydraulic engine of the type comprising working chambers and working members having two working faces and movable in said chambers under the action of a working fluid for actuating the engine, said engine lying in a fluid under ambient high pressure, whereby each of said working members is submitted on one working face to said ambient high pressure and on the other working face to the pressure of the fluid in said working chamber, means being provided for connecting each of said working chambers in turn with an external low pressure source for moving the corresponding working members (working stroke) and with said ambient high pressure (return stroke).

4,044,655

HIGH PRESSURE PLUNGER AND METHOD OF MANUFACTURE

Wilbur L. Kennicott, Ligonier, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Oct. 1, 1975, Ser. No. 618,412
Int. Cl.² F16J *1/02*
U.S. Cl. 92—258 **3 Claims**



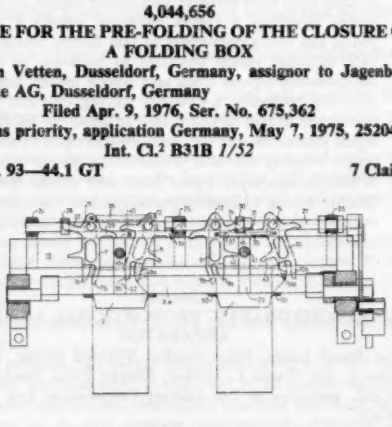
1. A high pressure plunger comprising a tubular member of cemented hard metal carbide, said tubular member having a length over diameter ratio of at least six to one, and having opposite ends, steel end caps abutting the opposite ends of said tubular member and each end cap having an axial portion engaging the inside of said tubular member adjacent the respective end cap, a rod-like portion on one of said end caps extending axially through said member with radial clearance and threadedly connected to the other end cap for interconnecting said end caps internally of said tubular member and holding said tubular member in a predetermined, compressively stressed condition, one of said end caps forming the rearward end of said plunger and the other end cap forming the forward end of said plunger, said rearward cap adapted for engagement to be driven linearly, a deformable metallic seal interposed between said forward end cap and said tubular member sealing the internal region of said tubular member from the atmosphere surrounding the forward end of the plunger, and orifice means formed between the rear end cap and the tubular member connecting the internal region of the tubular member with the atmosphere surrounding the rear cap of the plunger.

4,044,656

DEVICE FOR THE PRE-FOLDING OF THE CLOSURE OF A FOLDING BOX

Wilhelm Vetten, Dusseldorf, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany

Filed Apr. 9, 1976, Ser. No. 675,362
Claims priority, application Germany, May 7, 1975, 2520404
Int. Cl.² B31B *1/52*
U.S. Cl. 93—44.1 GT **7 Claims**



1. In a device for the pre-folding of a closure on a folding box of rectangular cross-section, which closure is formed of the creased unslotted end portion of the walls of the box of which two opposite closure panels are each provided with a

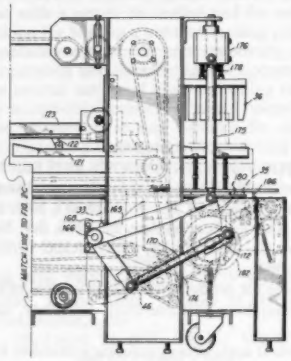
pair of creases running from the corners and converging away therefrom so as to form triangular pockets upon folding, the device comprising two pairs of folding tools which pairs are at 90° to one another, means for displacing said folding tools so as to effect a pre-fold, a plunger corresponding in shape to the cross-section of the box, and means for reciprocating said plunger into and out of said box, said plunger when in said box serving as a backing means during a pre-folding tool of that pair which is associated with the creased opposite closure panel is bifurcated so as to have a folding tine and an unfolding tine, each of said bifuracted tools being positioned so that during pre-folding one tine is within said box and the other outside said box.

4,044,657

CASE ERECTOR

Donald G. Reichert, Tarpon Springs, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

Division of Ser. No. 496,028, Aug. 9, 1974, Pat. No. 3,952,636.
This application Jan. 21, 1976, Ser. No. 651,078
Int. Cl.² B31B *1/64*
U.S. Cl. 93—49 M **5 Claims**



1. A method of erecting a case having opposed front and rear panels and opposed side panels, comprising the steps of:

a. folding said front and rear panels inwardly to a generally horizontal position;

b. bending a selected one of said side panels inwardly to a position beneath and in underlying relationship to said folded front and rear panels;

c. applying an adhesive to the bottoms of said bent side panel;

d. folding the other side panel to a generally horizontal position underlying the bottom side of said bent side panel; and

e. upwardly urging the bottommost side panel while simultaneously applying a downward force directed upon the upper surfaces of said front and rear panels and said bent panel.

4,044,658

APPARATUS FOR FOLDING PANELS OF CARTON BLANK

John M. Mitchard, Cherry Hill, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Apr. 1, 1976, Ser. No. 672,729
Int. Cl.² B31B *3/26*
U.S. Cl. 93—49 R **9 Claims**

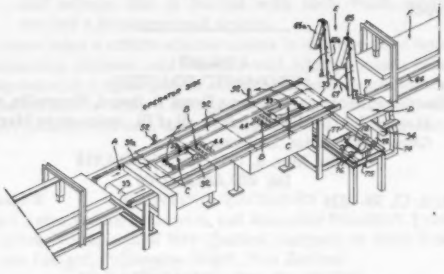
1. Apparatus for folding a bulk box blank scored to define side panels in which the opposite ends of the blank will be brought together to form a flat tube comprising:

a folding table;

means to feed the box blank onto the said table into a predetermined position;

means to retain the said blank in such predetermined position;

means to successively fold the panels at each end of the blank toward each other to bring the outer ends of such panels together for joining to form a tube comprising an upstream arm rotatable approximately 180° to fold the one



said panel at one end and a downstream arm rotatable more than 90° to fold the other said panel at the opposite end;

a hold-down device adapted to apply pressure to the top of the folded blank and restrain the folded blank in flat condition; and

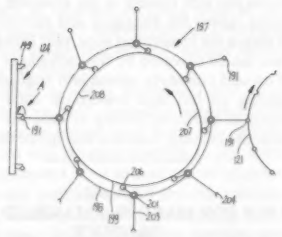
means to feed the folded blank from beneath the hold-down device.

4,044,659

APPARATUS FOR MAKING COMPOSITE FILTER PLUGS

Dietrich Bardenhagen; Helmut Niemann, both of Hamburg; Wolfgang Steiniger, Bornsen; Gerhard Tolasch, and Wolfgang Wiese, both of Hamburg, all of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Oct. 14, 1975, Ser. No. 622,333
Claims priority, application United Kingdom, Oct. 15, 1974, 44544/74
Int. Cl.² B65G *47/32*
U.S. Cl. 93—77 FT **2 Claims**



1. Apparatus for the production of composite filter plugs for cigarettes or the like, comprising means for assembling rod-like filter sections of several types into groups of assorted coaxial filter sections which move sideways toward a first station, including a discrete set of conveyors for the sections of each of said types; an auxiliary conveyor having a plurality of holder means for transferring groups directly to said first station and means for changing the distance between said holder means; means for transferring successive groups from said first station to a second station where said groups move axially, including a rotary carrier having at least one eccentric holder arranged to accept groups at said first station and to transport the thus accepted groups to said second station and means including a

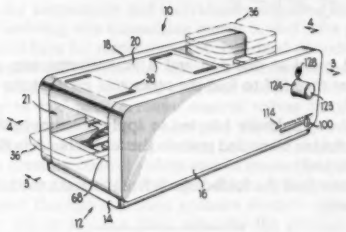
linkage for turning said holder with respect to said carrier during rotation of the carrier so as to maintain said holder in parallelism with groups arriving at said first station and to thereupon maintain the orientation of said holder substantially unchanged during travel from said first to said second station; means for converting the groups arriving at said second station into a continuous rod-like filler, for moving the filler axially and for draping the filler into a web to form a continuous filter rod; and means for subdividing the filler rod into discrete rod-like plugs each of which contains a section of each of said types.

4,044,660

AUTOMATIC TOASTER

Douglas P. Montague, Chicago; Derek A. Brand, Naperville, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 8, 1976, Ser. No. 664,918
Int. Cl.² A47J 37/08
U.S. Cl. 99—326 **8 Claims**



1. A toaster for automatically toasting a predetermined number of bread slices or the like comprising:
   a housing including a discharge station at one end;
   a loading station on the housing generally at an end opposite from the discharge station for supporting a generally vertical stack of bread slices;
   conveyor means mounted on the housing for continuously feeding the bread slices one at a time from the bottom of the stack through the housing to the discharge station;
   a pair of heating elements mounted on the housing between the loading station and the discharge station, on either side of the conveyor means; and
   lifting means mounted on the housing adjacent the loading station on the side thereof in the direction of travel of the conveyor means for engaging and elevating the slices of bread above the lowermost slice, said lifting means including cam means actuated by the movement of said slices of bread on said conveyor means into engagement therewith for raising all but said lowermost slice relative to the conveyor to facilitate feeding of only the lowemost slice between the heating elements and to the discharge station.

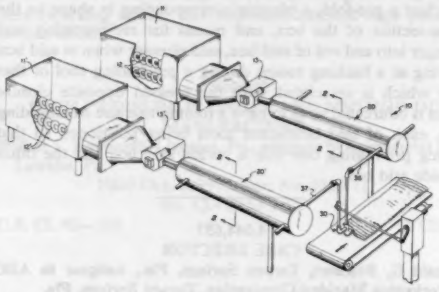
4,044,661

APPARATUS FOR MAKING A MARBLED MEAT FOOD PRODUCT

Alexander Balaz, Elkhart, Ind., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 521,241, Nov. 6, 1974, abandoned. This application July 24, 1975, Ser. No. 598,583
Int. Cl.² A47J 43/00
U.S. Cl. 99—355 **5 Claims**

1. A food processing system comprising: first pumping means for pumping a first dough containing a first coloring agent through a first swept surface heat exchanger into the entrance of a first conduit, said first conduit having an entrance and an outlet end, said first conduit being substantially closed at its outlet end and having a plurality of openings adjacent to the substantially closed outlet end; second pumping means for pumping a second dough containing a second coloring agent through a swept surface heat exchanger into the entrance of a second conduit, said second conduit having a discharge port and an inner cavity, said inner cavity of said second conduit



completely enclosing said outlet end of said first conduit whereby said second dough containing a second coloring agent may be admixed with said first dough.

4,044,662

APPARATUS FOR CONTINUOUS CHEESE MAKING

Joseph Savarese, 386 Commercial St., Boston, Mass. 02109

Continuation-in-part of Ser. No. 528,207, Nov. 29, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,510
Int. Cl.² A01J 25/06, 25/00; A23C 19/02
U.S. Cl. 99—460 **2 Claims**

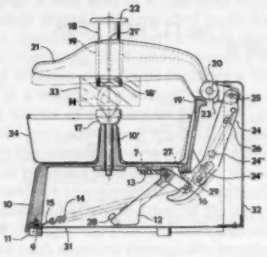
1. A machine for producing a cheese from a milk containing liquid that coagulates to form curd and whey, said machine comprising:
   a. a cylindrical upright tank defining a chamber for receiving the milk containing liquid;
   b. inlet means near the central portion of said tank for introducing and radially dispersing the milk containing liquid into said tank;
   c. first cutting means horizontally disposed in said tank at an upper portion thereof, said first cutting means operative to cut rising curd into elongated vertical bars;
   d. rotatable blade means horizontally disposed within said tank at an upper region thereof above said first cutting means, said blade means including a pair of outwardly extending blades, each said blade having a substantially C-shaped profile in right cross section, said blades extending outwardly in a curved path from diametrically opposite locations, said blades defining an abbreviated spiral configuration;
   e. drive means connected to said blade means for rotating said blade means;
   f. second cutting means vertically disposed in said tank at the upper region thereof above said first cutting means and substantially coplanar with said blade means, said blade means operative to push said elongated bars inwardly through said second cutting means to form diced pieces;
   g. discharge means disposed near the central upper portion of said tank about an axis of rotation of said blade means and slightly below said second cutting means for receiving said diced pieces, said diced pieces transmitted exterior to said tank through said discharge means; and
   h. outlet means disposed at a bottom region of said tank, said outlet means including means for closing and opening said outlet means.

4,044,663

NUT SHELLER

Jesse Harold Straw, R.R. No. 3, Box 193A, Tyrone, Pa. 16686

Filed Mar. 10, 1976, Ser. No. 665,560
Int. Cl.[2] A23N *5/00*; A47J *43/00*
U.S. Cl. 99—577 7 Claims



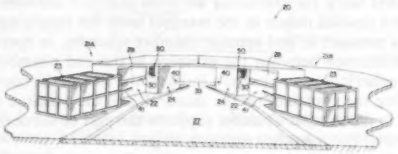
1. A nut sheller comprising a base, a nut supporting anvil mounted on said base for limited movement, an opposing inertial anvil operably mounted on said base for movement into engagement with a nut to be shelled and for movement to a remote position for loading a nut into shelling position, a hammer for operating against the nut supporting anvil, spring means for operating said hammer and an operataing lever for moving the inertial anvil and also controlling the hammer, a link having an operable connection to said operating lever and an operable connection to said hammer for energizing the spring as the operating lever moves the opposing anvil from its position remote from the nut to be shelled, and upon being operated provides a shelling of said nut with an opposing spring activating a hammer blow.

4,044,664

SYSTEM FOR THE HANDLING OF SOLID WASTE

Hyman Budoff, Akron, Ohio, assignor to Hybud Equipment Corporation, Akron, Ohio

Filed Sept. 18, 1975, Ser. No. 614,357
Int. Cl.[2] B30B *15/18*
U.S. Cl. 100—48 4 Claims



1. A solid waste handling system having multiple and operatively interconnected stations, each said station having a hopper unit with an opening in a side thereof for receiving such waste, a removable storage unit for such waste, and a compactor unit having a reciprocally driven compactor means, for transferring such waste from said hopper unit and compacting such waste in said storage unit, and an associated control means for actuating said compactor means,

each said hopper unit having a door pivotally mounted for opening and closing movement relative to said side opening therein and an associated hopper unit control means for actuating said movement of said door, the mounting of said door including a projection oscillating between an upper position when said door is open and a down position when said door is closed,

each said hopper unit further having (1) an upper limit switch operatively connected with said hopper unit control means and positioned for engagement with said mounting projection when in said upper position whereby opening movement of said door is stopped, and (2) a lower limit switch operatively connected with said hopper unit control means and said compactor unit control means and positioned for engagement with said mounting projection when in said lower position whereby closing movement of said door is stopped and said compactor means is reciprocated through said hopper unit,

each said compactor unit having associated therewith a detector means responsive to the density of such accumulated waste in each said storage unit for detecting when said storage unit is packed with such waste having reached a predetermined density,

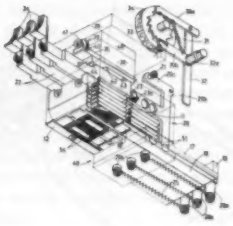
there being a station selector means in said operative interconnection between said stations, said selector means being responsive to a signal generated by one of said compactor unit detector means when a storage unit associated therewith has been packed with such waste having a predetermined density.

4,044,665

PRINTING MACHINES

Kurt Anton Kuhne, Manawatu, and Alexander Wassilieff, Palmerston North, both of New Zealand, assignors to Delta Plastics Limited, Palmerston North, New Zealand

Filed Mar. 11, 1976, Ser. No. 666,058
Claims priority, application New Zealand, Mar. 12, 1975, 176915
Int. Cl.[2] B41J *1/60*
U.S. Cl. 101—21 15 Claims



1. A magazine type printing head for a printing machine comprising:

at least one two part chamber;

a first stack of typeface carrying slugs in a first of said parts, one end of said first stack defining a printing position;

a second stack of typeface carrying slugs in the second of said parts, one end of said second stack defining a removal position, the other end of said second stack defining a depositing position;

operating means movable between a rest position and a second position, said operating means including a first means to move a first slug from the end of said stack remote from said printing position to the depositing position of said second stack as said operating means is moved from said rest position to said second position; and

cooperating means on said slugs for moving each slug in said first stack away from said printing position, said operating means further including a second means to move a second slug from the removal position of said second stack to the printing position of said first stack when said operating means is moved from said second position to said rest position.

4,044,666

ATTACHMENT FOR OFFSET DUPLICATING MACHINE

Laurent Doucet, 13, l'Assomption, Repentigny, Quebec, Canada

Filed Mar. 24, 1976, Ser. No. 670,050
Int. Cl.[2] B41L *45/00*
U.S. Cl. 101—76 12 Claims

1. An attachment device for use with an offset duplicating

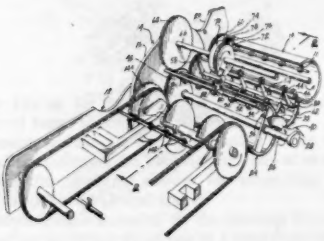
machine having, at the delivery end thereof, rotary cylinder means including circular gear means and sheet gripping means for conveying a sheet to said delivery end, said device being provided for imprinting consecutive code characters on successive sheets being delivered from said duplicating machine, comprising, in combination:

a frame consisting of laterally spaced sidewalls fixedly attached to said delivery end of said machine;

an impression cylinder rotatably mounted, at opposite ends thereof, to said sidewalls, said impression cylinder including circular gear means and sheet gripping means;

a gripper bar device rotatably mounted to said sidewalls and being disposed between said rotary cylinder means of said duplicating machine and said impression cylinder; said gripper bar device including circular gear means in meshing engagement with said circular gear means of said rotary cylinder means and with said circular gear means of said impression cylinder, said gripper bar device further including a series of sheet gripping elements for gripping a sheet received from said rotary cylinder means and for conveying said sheet to said sheet gripping means of said impression cylinder;

character printing means mounted to said sidewalls, including: a rotatable shaft, circular gear means on said shaft in



meshing engagement with said circular gear means of said impression cylinder, and an actuable character containing device mounted on said shaft for rotation therewith and adapted to successively contact said sheets, when conveyed on said impression cylinder, for printing consecutive characters thereon;

character changing means, mounted to said sidewalls, including actuator means contacting said character containing device for consecutively changing characters for each successive sheet printing operation;

means associated with said impression cylinder for raising said impression cylinder to said character containing device for each successive sheet printing operation;

said impression cylinder including a shaft supported on said sidewalls and having an eccentric portion; and wherein said means associated with said impression cylinder includes lever means pivotally mounted to one of said sidewalls for actuating said eccentric portion and raising said impression cylinder for contacting engagement between said sheet thereon and said character containing device; and

a cam mounted to one end of said rotatable shaft of said character printing means outside said one sidewall for contacting and actuating said lever means.

4,044,667

MANDRELS FOR SUPPORTING CONTAINERS WITH NEGATIVE AND POSITIVE AIR PRESSURE

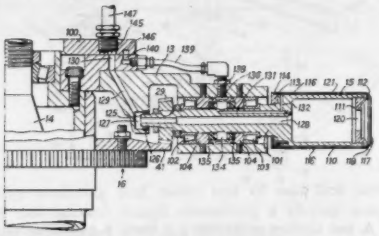
John Maxwell Jackson, Potters Bar, England, assignor to Chromax Limited, Perrywood Worcester, England

Filed Feb. 13, 1975, Ser. No. 549,819

Claims priority, application United Kingdom, Feb. 13, 1974, 6620/74

Int. Cl.² B41F 17/28

U.S. Cl. 101—38 R **9 Claims**



1. A rotary mandrel for holding and centering a container having a base, a side wall which is circular in cross-section and an open top at the end of the side wall remote from the base, said mandrel comprising a body having an inner end thereof mounted on a support and an outer end insertable into the interior of the container through the open top thereof, the mandrel body being rotatable about the longitudinal axis of the mandrel body and having two axially spaced centering rings on the periphery thereof co-axial with said rotational axis, said centering rings being engageable with the side wall of the container to centralize the container with respect to said rotational axis upon axial movement of the container on the mandrel body towards the inner end thereof, and said rings subdividing the space enclosed between the container and the mandrel body therein into an end chamber between the mandrel body and the base of the container and an annular chamber between the mandrel body and the side wall of the container, said end chamber being pneumatically sealed from said annular chamber when said centering rings engage a side wall of a container fitted on the mandrel, first conduit means in the mandrel body for extracting air from said end chamber, and second conduit means in the mandrel body for supplying fluid under pressure to said annular chamber whereby, in operation, the difference between the pressure in the end chamber and atmospheric pressure exerts a force on the base of the container holding the container on the mandrel, and the pressure of the fluid in the annular chamber supports the part of the container side wall between the centering rings.

7. A multi-cylinder printing machine for printing on containers of a standard size each having a base, a side wall which is circular in cross-section and an open top at the end of the side wall remote from the base, said printing machine comprising a frame, a turret rotatably mounted on the frame, and a plurality of rotary mandrels mounted on the turret and adapted to hold said containers, said frame having a plurality of stations disposed around the turret, said stations including a container loading station, a container unloading station, and printing stations between the container loading and unloading stations in the circumferential direction of the turret, and said turret being angularly movable to index each mandrel in succession to each of said stations, wherein each of said mandrels comprises a support member on said turret, a mandrel body mounted on said support member for rotation about the longitudinal axis of the mandrel body, said mandrel body having an outer end insertable into the interior of one of said containers through the open top thereof and having two axially spaced centering rings on the periphery of the mandrel body co-axial with said longitudinal axis, said centering rings being engageable with the side wall of the container to centralize the container with respect to said longitudinal axis upon axial move-

ment of the container on the mandrel body towards its support member, and said rings sub-dividing the space enclosed between the container and the mandrel body therein into an end chamber between the mandrel body and the base of the container and an annular chamber between the mandrel body and the side wall of the container, said end chamber being pneumatically sealed from said annular chamber when said centering rings engage a side wall of a container fitted on the mandrel, first conduit means in the mandrel body for extracting air from said end chamber, and second conduit means in the mandrel body for supplying fluid under pressure to said annular chamber, and wherein said frame includes a vacuum conduit connectable to a source of vacuum, a pressure conduit connectable to a source of fluid under pressure, and distribution means operable upon rotation of the turret to connect said first conduit means of each mandrel to said vacuum conduit during passage of said each mandrel through the loading station and printing stations and to connect said second conduit means of each mandrel to said pressure conduit during passage of said each mandrel through the printing stations, whereby, during passage of said each mandrel through the printing stations, the difference between the pressure in the end chamber and atmospheric pressure exerts a force on the base of the container holding the container on the mandrel, and the pressure of fluid in the annular chamber supports the part of the container side wall between the centering rings.

4,044,668

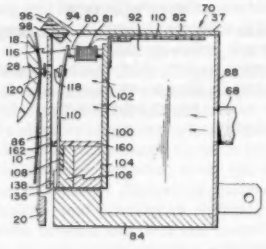
PRINT HAMMER MECHANISM

Gordon Brent Barrus, and Leo Joseph Emenaker, both of El Segundo, Calif., assignors to Printronix, Inc., Irvine, Calif.

Continuation of Ser. No. 578,180, May 16, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,746

Int. Cl.² B41J *7/70*

U.S. Cl. 101—93.04 **18 Claims**



1. A hammer mechanism for a printer comprising:

a housing having a hollow interior and a magnetic portion thereof;

means for introducing air under pressure into the interior of the housing;

an elongated magnetic circuit structure including permanent magnet means extending along the length of the magnetic circuit structure, the length of the magnetic circuit structure being divided into a succession of like hammer element positions, there being a dummy hammer element position adjacent each end of the magnetic circuit structure and a plurality of intermediate hammer element positions therebetween;

a different resilient magnetic hammer element coupled to the magnetic circuit structure in each of the intermediate hammer element positions and only in the intermediate hammer element positions, each hammer element being disposed adjacent the magnetic portion of the housing and separated from the other hammer elements;

a plurality of electrical coils, each being mounted on the magnetic circuit structure in a different one of the hammer element positions and extending into the region of a different one of the hammer elements; and

means for selectively energizing the electrical coils to momentarily release the associated hammer elements from the electrical coils.

4,044,669

ROTARY SCREEN MOUNTING DEVICE

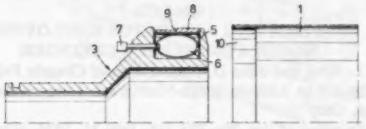
Harald Johan Luther, Alingsas, Sweden, assignor to Almedahls Aktiebolag, Alingsas, Sweden

Filed May 30, 1975, Ser. No. 582,434

Claims priority, application Sweden, May 30, 1974, 7407201

Int. Cl.² B41F *15/38*

U.S. Cl. 101—127.1 **6 Claims**



1. A device for releasably mounting a thin walled cylindrical member in a rotary machine, whereby said cylindrical member can be installed and maintained in an axially stretched condition and used in rotary working operations, comprising a pair of cylindrical mounting members disposed in spaced axial alignment in said rotary machine, each of said mounting members comprising an annular outer peripheral slot, a radially outwardly expansible ring member containing an annular outer peripheral groove disposed in said slot within the outer periphery of each said mounting member, annular expansion means disposed in said slot for outwardly expanding said ring member, said thin walled member comprising a peripheral flange disposed on the inner annular surface of each end thereof, said peripheral flange of said thin walled member engaging said groove of said ring member and being retained therein upon expansion of said ring member, whereby when both of said flanges are engaged and retained in said respective groove members, said thin walled member can be axially stretched and maintained in an axially stretched condition for use in rotary working operations.

4,044,670

STENCIL DUPLICATOR

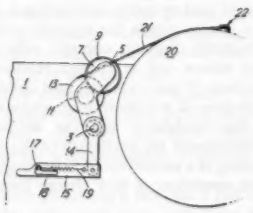
Michael Maynard, London, England, assignor to Gestetner Limited, London, England

Continuation-in-part of Ser. No. 397,305, Sept. 14, 1973, Pat. No. 3,943,850. This application Dec. 2, 1975, Ser. No. 636,821

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.² B41F *15/12*

U.S. Cl. 101—128.1 **6 Claims**



1. A stencil duplicator including at least one duplicator cylinder; means carried by said at least one duplicator cylinder for holding a stencil for rotation with said cylinder; a core for receiving one end of said stencil during removal of the stencil from said duplicator; means operatively connected to said at least one duplicator cylinder for driving said cylinder for

rotation in use of the duplicator; torque limiting core holding means constructed to removably support said core for rotation adjacent and parallel to said at least one cylinder; core driving means optionally engageable with said duplicator for transmitting limited torque drive from said cylinder drive means to said core holding means, said core driving means being effective to rotate said core with a surface speed higher than that of said at least one duplicator cylinder but with a limiting maximum torque transmitted to said core; and means for optionally engaging drive from said duplicator cylinder to said core driving means.

4,044,671

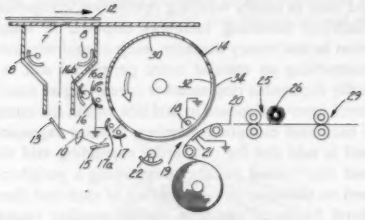
DUPLICATING APPARATUS EMPLOYING MODULATOR SCREEN CYLINDER

Shou L. Hou, and John D. Blades, both of Chagrin Falls, Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 493,216, July 31, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,786

Int. Cl.² B41F *15/08*

U.S. Cl. 101—129 **6 Claims**



1. A duplicating machine for making reproductions of a graphic original on a dielectric material utilizing aperture controlled electrostatic printing techniques, comprising:

photoconductive modulator means formed in the shape of a cylinder comprising a photoconductive layer sandwiched between a metal screen and a transparent insulating layer forming at least a segment of said cylinder;

support means for rotatably supporting said modulator cylinder including means for driving the cylinder;

exposure means for the slit-scan exposure of a stationary graphic original to produce and project a pattern of light and shadow;

means for creating a charge distribution system on the outside surface of said photoconductive modulator cylinder while rotating said cylinder at a first imaging speed, said image corresponding to the pattern of light and shadow projected from said graphic original;

a charge particle imaging station positioned in the path of movement of said cylinder comprising a charge particle generating source within the cylinder and a curved collecting electrode disposed opposite said charge particle generating source and in convex relationship with the outside surface of said cylinder, said collecting electrode having a degree of curvature to produce an electric field between the modulator and the collecting electrode which compensates for curvature of the modulator, said drum rotating at a second speed faster than said first speed during the operation of said charge particle generating source;

a supply of dielectric material;

means for feeding said dielectric material in contact with said collecting electrode for collecting thereon gas ions transmitted by the modulator cylinder; and

means for developing the dielectric material to create a visible image thereon.

4. A method of making reproductions of a graphic original on a dielectric material utilizing a rotatable photoconductive modulator means formed in the shape of a cylinder comprising a photoconductive layer sandwiched between a metal screen and a transparent insulating layer forming at least a segment of said cylinder comprising the steps of

mounting said modulator cylinder for rotation and rotating said cylinder at at least two different speeds;

scanning incremental portions of said graphic original and slit exposing said photoconductive modulator to generate a pattern of light and shadow of said graphic original;

projecting said pattern of light and shadow through an optical system onto said modulator cylinder;

generating a charge distribution system on the surface of said modulator cylinder while rotating at a first imaging speed corresponding to the pattern of light and shadow representing the light and dark portions of said graphic original;

projecting charged particles from a particle generating source at a charge particle imaging station onto the surface of said modulator cylinder while it is rotating at a second speed, said station disposed at a fixed position relative to the path of movement of said cylinder with said charge particle generating source positioned inside and adjacent the surface of said cylinder;

collecting said charge particles transmitted by the modulator cylinder on said dielectric material;

controlling the movement of said projected particles emanating from the charge particle generating means within said modulator cylinder to provide a charge pattern that corresponds precisely to said graphic original by providing a curved collecting electrode in convex relation to the modulator cylinder for supporting the dielectric material;

developing the dielectric material to create a visible image thereon.

4,044,672

PRINTING MACHINE, IN PARTICULAR AN OFFICE OFFSET MACHINE WITH MEANS FOR PRE-CURVING THE MASTER

Theodor Wilhelm Gorr, Birkerod, Denmark, assignor to Zeuthen & Aagaard A/S, Glostrup, Denmark

Filed July 30, 1975, Ser. No. 600,448

Claims priority, application Denmark, Aug. 5, 1974, 4169/74

Int. Cl.² B41F *1/28*

U.S. Cl. 101—132.5 **11 Claims**

1. A printing machine comprising a frame, a cylinder mounted on said frame with gripping members for a master to be wrapped around said cylinder, a table mounted on said frame along which the master is advanced to said cylinder during the mounting operation, said table comprising two parts, a stationary table part and a movable table part having front and rear edges, said front edge of said movable table part being positioned closer to said cylinder than said rear edge, said movable table part being located closer to the master cylinder than said stationary table part and pivotable around an axis positioned intermediate its front and rear edges which is parallel to the plane of said table and at right angles to the

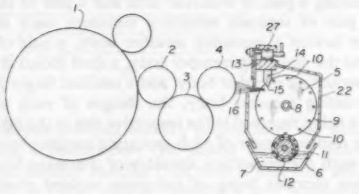
direction of advance of the master, a pivotable operating member positionable in contact with said movable table part for pivoting said movable table part about said axis, a stationary shaft mounted on said frame, and a guiding roller mounted rotatably around said stationary shaft and contactable by said master when being mounted, said movable table part being pivotable into a position in which its rear edge is located at a short distance from said guiding roller to enable the master to pass therebetween and alter the direction of travel of the master and to provide a means for giving pre-curvature to the master as it is advanced along the movable table part.

4,044,673

DAMPENING UNIT FOR OFFSET PRINTING MACHINES

Rudi Junghans, Wilhelmsfeld, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed July 23, 1976, Ser. No. 708,215
Claims priority, application Germany, July 25, 1975, 2533267
Int. Cl.² B41F 7/30
U.S. Cl. 101—148 **15 Claims**



1. Dampening unit for an offset printing machine comprising at least one dampening unit roller, a container for dampening medium and a rotatable sprinkler roller disposed mutually adjacent one another, said sprinkler roller comprising a shaft, a pair of discs disposed at opposite ends of said shaft and an envelope wettable by dampening medium from said container and formed of a plurality of means displaceable in a rotary path for throwing onto said dampening-unit roller from a region of an edge of said envelope extending along the length of said sprinkler roller droplets of dampening medium withdrawn from said container, said plurality of throwing means being stressed in tension between said discs and extending parallel to said shaft, and traverse means carrying a plurality of fingers disposed adjacent to and spaced from said discs and having respective edges projecting into said rotary path of said plurality of throwing means.

4,044,674

SPRAY DAMPENING SYSTEM FOR HIGH QUALITY OFFSET PRINTING

Roy R. Smith, Jr., Leawood, Kans., assignor to Smith R.P.M. Corporation, Lenexa, Kans.

Continuation-in-part of Ser. No. 491,290, July 24, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 637,879
Int. Cl.² B41F 7/30
U.S. Cl. 101—148 **5 Claims**

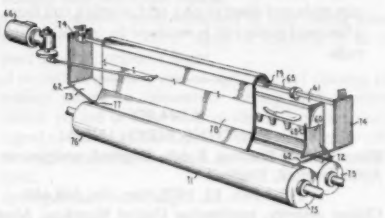
1. In combination with a printing press having a frame, an inking train and an offset plate cylinder which engages a blanket cylinder for transferring an ink image thereto, dampening apparatus comprising:

a. an elongated spray member having a line of several dampening liquid atomizing spray nozzles positioned on said press in laterally spaced relation; means reciprocating said spray member laterally of said press;

b. dampening roller means having opposite ends, said dampening roller means being positioned to receive spray from said nozzles and having a length between said roller means ends less than the spray path width emitted from said nozzles, including said reciprocation, whereby said spray path extends beyond said roller means ends;

c. a pair of spray shield means associated with said spray member and respectively positioned to intersect and prevent overspray beyond said roller means ends;

d. said spray shield means respectively having a first shield



and a second shield each with free dripping lower portions positioned over said roller means, said first shield being mounted on said spray member and said second shield being fixed with respect to said frame, whereby intersected spray is dripped onto said roller means; and

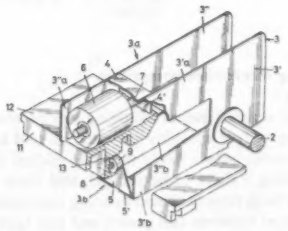
e. transfer means contacting said dampening roller means and transferring moisture to said plate cylinder.

4,044,675

PRINTING DEVICE HAVING A SLIDING CARRIAGE

Horst Jürgen Deisting, Berlin, Germany, assignor to Adrema Pitney Bowes GmbH, Heppenheim, Bergstrasse, Germany

Filed Sept. 29, 1975, Ser. No. 617,660
Claims priority, application Germany, Oct. 7, 1974, 2447714
Int. Cl.² B41F 3/20
U.S. Cl. 101—269 **2 Claims**



1. A printing device of the type to be operated in conjunction with a printing plate such as a credit card, the combination comprising:

a housing having at the upper portion thereof a pair of parallel, longitudinally extending openings,

a longitudinally extending rod disposed within said housing below the first of said openings,

a longitudinally extending anvil member, operative to receive and hold a printing plate, fixedly received within the second of said openings, said anvil having at its lower portion thereof a longitudinally extending aperture with upturned ends,

a U-shaped carriage having a base and a pair of arms extending laterally from said base, said base being received within said first opening and slidably and pivotably supported upon said rod, the first of said arms extending outside said housing and over said anvil, the second of said arms extending within said housing, said first arm at its end distal from said base rotatably supporting a printing roll over said anvil, said second arm at its end distal from said base rotatably supporting a guide roll which is received within said aperture, the axis of said printing roll and said guide roller being parallel to one another, said

printing roll and said guide roller being vertically aligned relative to one another and perpendicular to said anvil,

whereby said carriage is operative to be slid along said rod and to be pivoted upwardly when said guide roller is received within said upturned ends of said aperture thereby maintaining said printing roll is printing engagement with said anvil when located intermediate said aperture ends and disengaging said printing roll from said anvil when said guide roll is received by one of the said aperture ends.

4,044,676

PRINTING MECHANISM

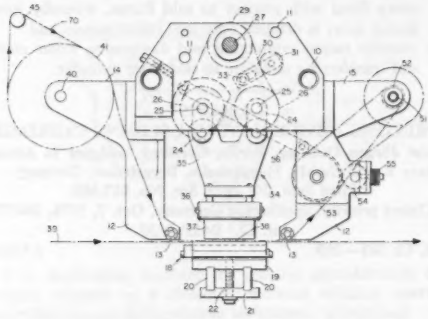
William Ronald Hudson, Leigh, England, assignor to Milford-Astor Limited, England

Filed Feb. 12, 1975, Ser. No. 549,444

Claims priority, application United Kingdom, May 6, 1974, 5830/74

Int. Cl.[2] B41F *1/04*

U.S. Cl. 101—297 **1 Claim**



1. Printing mechanism comprising

a housing

print head support means including a print head carrying a flat type of face movably mounted on said housing

a platen comprising a freely movable endless conveyor for supporting a sheet to be printed, said sheet moving forwardly with respect to said printing mechanism and being interposed between said platen and said type face

said platen being mounted on said housing and including a base fixed with respect to said housing and an extended planar portion adjacent said sheet and movable with respect to said housing, by pressure contact of said type face against said sheet, in a plane parallel with said sheet and in the direction of movement of said sheet, through a limited distance between a type face initial contact position and a type face release position,

said print head support means bodily moving said printing head relative to said housing along a path defining a closed curve around an axis that is substantially parallel to the plane of the sheet and platen, said path lying in a plane that is substantially perpendiuclar to the plane of the sheet and platen so as to bring said type face into printing contact with said sheet against said platen movable planar portion, said type face pinching said sheet against said planar portion, said type face and said sheet moving parallel during said printing contact and providing the sole driving force to move said platen therewith,

said platen planar portion being thereby moved parallel with said sheet and at the same linear speed and in the same direction as said sheet from said type face initial contact position to said type face release position during said printing contact.

4,044,677

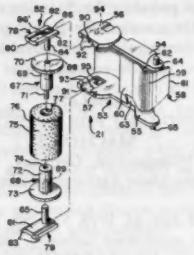
INKING MECHANISM

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 13, 1975, Ser. No. 604,389

Int. Cl.[2] B41K *3/60*; B41F *1/46, 31/33*

U.S. Cl. 101—348 **19 Claims**



1. An inking mechanism, comprising: an ink roller, an inker body having a pair of undercut slots and a pair of shoulders, and a pair of separate mounting members, each mounting member having a mounting member body, a pair of flanges joined to the mounting member body, a shaft joined at one end to the mounting member body, and a resilient finger joined to the mounting member body, the flanges of each mounting member being received in the respective slot in the inker body, and the resilient finger of each mounting member being cooperable with the respective shoulder of the inker body, each mounting member being of one-piece molded plastics construction.

4,044,678

PRINTING CYLINDER FOR PRINTING MACHINES

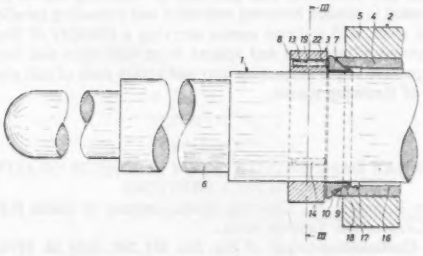
Claus Löwe Rasmussen, Horsens, Denmark, assignor to Schublich A/S, Denmark

Filed July 7, 1976, Ser. No. 703,209

Claims priority, application Denmark, July 14, 1975, 3199/75

Int. Cl.[2] B41F *27/10*

U.S. Cl. 101—378 **10 Claims**



1. A printing cylinder for printing machines, particularly flexoprinting machines and indirect photogravure printing machines, comprising a shaft (1), a sleeve (2) adapted to support a printing block and mounted on the shaft (1) with radial clearance, and two adjusting mechanisms (3), said adjusting mechanisms including a respective adjusting mechanism (3) provided at each end of said sleeve (2), each adjusting mechanism (3) being adapted to centre and secure the sleeve (2) on the shaft (1) and each comprising a guide ring (7) and a clamping ring (8), said guide ring (7) being provided with a circumferential conical guide surface (9) engageable with a corresponding circumferential conical guide surface (10) at each end of the sleeve (2), characterized in that a fit between the shaft (1) and the guide ring (7) is so easy that the guide ring (7) may be

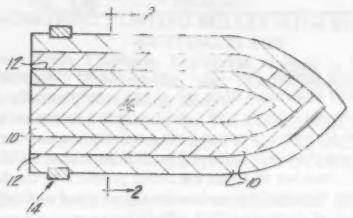
somewhat tilted relative to a plane at right angles to the longitudinal axis of the shaft (1), and that the clamping ring (8) comprises radial, adjustable securing means (11, 12) for securing said clamping ring to said shaft and axial adjusting means (13, 14, 15) for adjusting said guide ring.

4,044,679

LAMINATED ARMOR-PIERCING PROJECTILE

Victor H. Pagano, Rochester, and Server Tasdemiroglu, Sterling Heights, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 6, 1975, Ser. No. 619,874
Int. Cl.² F42B *13/06*
U.S. Cl. 102—52 **2 Claims**



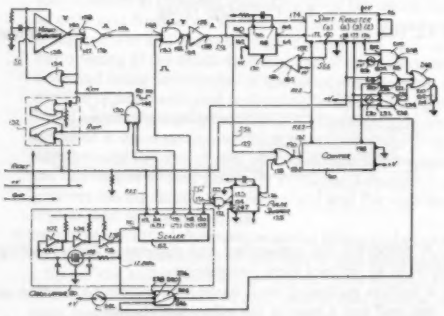
1. An armor-piercing military projectile of the solid type, comprising a central core (16) nested within a plurality of concentric metallic lamellae (10); each of said core and lamellae having an outer circular cylindrical side surface merging into an axial ogive termination at the projectile front end; each lamellae being a hollow annular shell structure having a substantially uniform wall thickness therealong; said lamellae and core terminating at a common transverse plane at the rear end of the projectile; copper bonding material fused to the core and lamellae surfaces along each entire interface; the lamellae being of decreasing hardness and increasing toughness measured from the outermost lamellae to the innermost lamellae; the outermost lamellae being a quenchhardened steel providing a relatively hard outer surface along the entire length of the projectile.

4,044,680

REMOTELY CONTROLLED ELECTRONIC FUZE

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed May 14, 1975, Ser. No. 577,510
Int. Cl.² F42C *11/00*
U.S. Cl. 102—70.2 R **5 Claims**



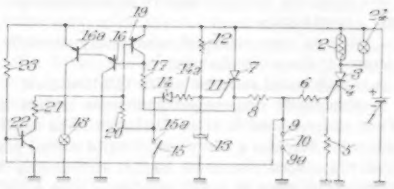
1. A weapon system comprising:
a projectile having a fuze,
said fuze including
detonator means,
timing means having output means for providing an output timing signal after a predetermined period of time,
detonator function means having output means coupled to said detonator means for providing a signal to actuate said detonator means,
impact responsive means coupled to said timing means for providing an output signal in response to an impact after a period of flight,
said impact responsive means upon impact causing said timing means to commence timing said predetermined period of time to provide said output timing signal to cause said detonator function means to actuate said detonator means at the end of said period of time,
said timing means including
a local oscillator,
a counter coupled to said oscillator for receiving and accumulating pulses therefrom,
said impact responsive means normally disabling said coupling between said oscillator between said oscillator and said counter and upon impact enabling said counter to thereafter receive pulses from said oscillator and upon accumulating a predetermined count to provide said output timing signal.

4,044,681

CONTROL CIRCUIT FOR THE CONDUCTION OF AN ELECTRONIC SWITCH

Henri Edouard Courier de Méré, Paris, France, assignor to Bicosa Societe de Recherches, Clichy, France

Filed Nov. 12, 1975, Ser. No. 631,110
Claims priority, application France, Nov. 14, 1974, 37623/74
Int. Cl.² F42C *11/00*
U.S. Cl. 102—70.2 R **11 Claims**



1. Detonation circuit for firing a detonator, comprising a detonator to be fired, a D.C. source, a first electronic switch which includes a control electrode and is connected in series with the detonator and the D.C. source, a feed circuit for the control electrode of the first electronic switch, a second electronic switch, which includes a control electrode, triggering means arranged to offer, in response to detection of an event, an increase in value of resistance from below a first, lower limit to above a second, upper limit, and means for putting the detonation circuit into a state of readiness by giving a conduction signal to the control electrode of the second electronic switch in order to make it conducting wherein the second electronic switch is situated in the feed circuit of the control electrode of the first electronic switch, and the triggering means is situated in series with said second electronic switch, and is adapted to prevent the supply of current from said second electronic switch to the control electrode of said first electronic switch when said second electronic switch is conducting and said triggering means has a value of resistance less than that of said lower limit, said second electronic switch being adapted to provide a control signal to the control electrode of the first electronic switch, when the second electronic switch is conducting and the triggering means has a resistance

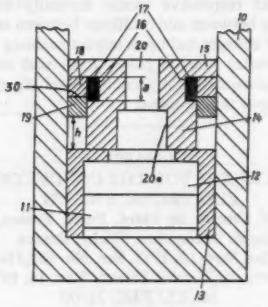
above the second limit, to render said control electrode of the first electronic switch conductive.

4,044,682

IGNITION CURRENT GENERATOR FOR AN ELECTRICAL PROJECTILE FUZE

Panayotis Karayannis, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Dec. 4, 1975, Ser. No. 637,639
Claims priority, application Switzerland, Dec. 6, 1974, 16212/74
Int. Cl.² F42C *11/04*; F42B *9/00*; F42C *9/00, 19/12*
U.S. Cl. 102—70.2 GA **2 Claims**



1. An ignition current generator for an electrical projectile fuze of a projectile having a lengthwise extending axis comprising in combination:

a. a soft iron core arranged substantially coaxially with respect to the projectile axis;

b. an induction coil surrounding the soft iron core;

c. a substantially ring-shaped permanent magnet having front and rear end faces and arranged to be axially displaceable between a first position and a second position, said ring-shaped permanent magnet surrounding the induction coil when in its first position to close a first magnetic circuit;

d. a soft iron ring which, viewed in the direction of the projectile, is secured at said rear end face of said ring-shaped permanent magnet;

e. said soft iron ring being secured at said rear end face of said ring-shaped permanent magnet in that said ring-shaped permanent magnet and said soft iron core are mutually bonded to one another;

f. said soft iron core possessing a flange at which bears said substantially ring-shaped permanent magnet with said front end face thereof when in its first position for closing said first magnetic circuit;

g. said soft iron core being provided at its periphery with a groove, said induction coil being located in said groove;

h. said soft iron core possessing an outer substantially cylindrical surface;

i. said substantially ring-shaped permanent magnet having a substantially inner cylindrical surface; and

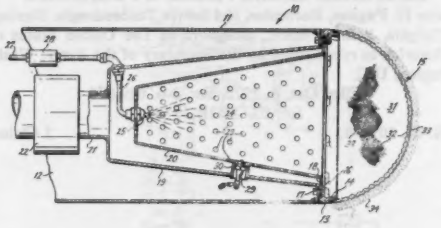
j. said substantially ring-shaped permanent magnet, when in said second position, bearing by means of said inner cylindrical surface at said outer cylindrical surface at a location spaced from said induction coil in order to close a second magnetic circuit spaced from said first magnetic circuit.

4,044,683

HEAT GENERATOR

Harold H. Ostroff, Normandy, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Aug. 20, 1959, Ser. No. 835,815
Int. Cl.² F42B *4/26*
U.S. Cl. 102—90 **2 Claims**



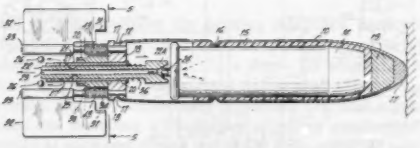
1. A decoy missile for high speed air travel comprising the improvement of a casing open at one end, a substantially closed air receiving chamber in said casing, conduit means supplying combustion air under pressure from a remote source connected to said closed chamber, hollow flameholder means mounted in said closed chamber to admit air under pressure to the hollow interior, said flameholder means having an open end adjacent said one end of the casing, fuel supply spray means connected to said flameholder means to supply fuel thereto under pressure, igniter means to initiate combustion of the fuel sprayed into the air within the hollow interior of said flameholder means, and a heat radiating foraminous member carried by said casing over the open ends of said casing and flameholder means and exposed for viewing in the high speed air stream, said foraminous member forming with the hollow interior of said flameholder means an enclosed combustion space and being composed of a finely perforated sintered porous material through which the hot combustion gases pass and which imposes a substantial pressure drop between the combustion space and the exterior surface of said member to create a layer of hot gases on the exterior surfaces which is relatively stable in the high velocity air flow about said casing and over the exterior of said member, the products of combustion passing through said foraminous member acting to soak said member and raise the temperature thereof to infrared to emission temperature.

4,044,684

AEROSOL PROJECTILE FOR LACHRYMATING MATERIAL

Guido John Gaggini, Cowansville, and Eugene Lawrence Gould, Kittanning, both of Pa., assignors to Federal Laboratories, Inc., Saltsburg, Pa.

Filed July 13, 1976, Ser. No. 704,788
Int. Cl.² F42B *13/46*
U.S. Cl. 102—90 **6 Claims**



1. A projectile for conveying and dispersing lachrymating material in an aerosol form comprising:

a. a hollow enclosing shell having an impacting portion at one end and a base at the other end thereof.

b. a container having a quantity of lachrymating material under pressure within the shell;

c. valve means for the container disposed adjacent the base of the shell for dispensing the said lachrymating material;
d. a plurality of stabilizing fins swingably carried by and extending outwardly of the base.
e. a washer shaped member carried in the base of the shell said washer shaped member having a central opening therein;
f. an actuating plunger slidably carried within the washer opening in alignment with the valve means;
g. locking means engagable with the actuating plunger until shell impacting;
h. an inertial member, slidably disposed about the plunger and overlying the locking means and;
i. tabs carried by the fins to hold the locking means in engagement with the plunger and inertia member until launching of the shell.

4,044,685

JACKETLESS HUNTING BULLET WITH ROLL-BACK CUTTING FLAGS

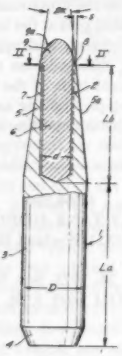
France Avcin, Ljubljana, Yugoslavia, assignor to Hirtenberger Patronen-, Zundhutchen- und Metallwarenfabrik Aktiengesellschaft, Hirtenberg, Austria

Continuation-in-part of Ser. No. 442,432, Feb. 14, 1974, abandoned, which is a continuation of Ser. No. 264,278, June 19, 1972, abandoned. This application Feb. 27, 1976, Ser. No. 662,166

Claims priority, application Austria, June 18, 1971, 5291/71

Int. Cl.[2] F42B *11/10*

U.S. Cl. 102—91 **2 Claims**



1. A jacketless hunting bullet comprising:

a one-piece projectile body having a solid cylindrical portion extending over at least half the length of the bullet and a frustoconical head converging away from said solid cylindrical portion, said head being formed with a generally cylindrical chamber extending over the entire length of only said frustoconical head, terminating at said cylindrical portion and defined by an internal wall, said chamber opening at the small-diameter end of the frustoconical head and being surrounded at the latter end by a thin wall portion of said head, said wall being formed with a plurality of angularly equispaced axially extending grooves of constant V cross section with the wide part of the V being open toward the axis of said body, said grooves extending the full length of said generally cylindrical chamber, said grooves having depths of substantially half the wall thickness of said wall portion; and

a mass of plastically deformable material filling said chamber and projecting therefrom at said end of said head to form a tip for the bullet, said tip having an outer surface flush with the external surface of said head at said portion, said mass reaching substantially to the solid cylindrical portion, said head having a length L_b, said body having a total length (L_a+L_b), said solid cylindrical portion having a diameter D, said chamber having a diameter d and the parameters L_a, L_b, D and d being related so that the ratio $d:D$ is about 0.50 ± 0.15; the ratio $d:L_b=1:3$ to 1:4; and the ratio $(L_a+L_b)/D=4.0\pm1.0$.

4,044,686

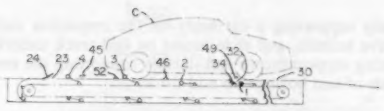
REDUCED LENGTH VEHICLE CONVEYOR

Russel A. Van Brakel, Harshaw, Wis., assignor to Haverberg Auto Laundry Equipment Co. Inc., Chicago, Ill.L

Filed Oct. 30, 1975, Ser. No. 627,222

Int. Cl.[2] B61B *13/12*

U.S. Cl. 104—172 B **2 Claims**



1. A compact conveyor for moving a vehicle by sequentially engaging one each of the front and rear wheels of the vehicle and moving them along a path, comprising:

an active track for supporting the wheels of the vehicle and having a roller drop slot intermediate its ends,

an inactive track paralleling said active track and lying therebelow,

a plurality of spaced rollers positionable along said inactive track and also along said active track for engaging the wheels of the vehicle on said active track, said rollers being spaced apart less then the length of said active track,

drive means having a roller driving run for moving the rollers along said inactive track or active track,

means for selectively moving the rollers into said active track for propelling a wheel or for moving the rollers along said inactive track for by-passing the wheels,

roller removing means for selectively removing a roller in engagement with a front wheel of the vehicle from the active track to the inactive track through said roller drop slot to disengage the roller prior to the termination of said roller driving run so that the roller no longer propels the front wheel still resting on the active track, said roller removing means including a roller drop guide, an overcenter linkage for holding the roller drop guide in a raised wheel-passing position covering said roller drop slot for supporting the weight of a vehicle wheel, and power means operatively connected to said linkage for selectively positioning the roller drop guide between said raised wheel-passing position and a lowered roller-dropping position exposing the roller drop slot, and

control means for actuating said power means to remove a roller and actuating said means for moving a roller into the active track for bringing a subsequent roller into engagement with a rear wheel of the vehicle in a sequence to first move the vehicle by pushing against the front wheel and then moving the vehicle through the remainder of said driving run by pushing against the rear wheel.

4,044,687

TRUCK FOR THE COMMON PIVOTAL SUPPORT OF TWO CAR BODIES

Helmut Bugarcic, Berlin, Germany, assignor to Linke-Hofmann-Busch GmbH, Germany

Filed Aug. 21, 1975, Ser. No. 606,549

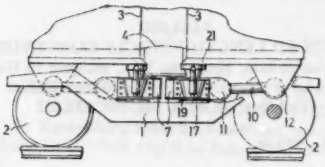
Claims priority, application Germany, Aug. 21, 1974, 2440069

Int. Cl.[2] B61F *5/08*

U.S. Cl. 105—4 R **8 Claims**

1. A truck for the pivotal support of two car bodies, particularly of articulated rail motor cars, comprising a truck frame, a vertical pivot for each car body mounted in closely spaced longitudinal locations on said truck frame, a transversely ex-

tending swiveling bolster mounted intermediate its length for pivoting movement about each of said vertical pivots, spring support means adjacent each end of each of said bolsters for



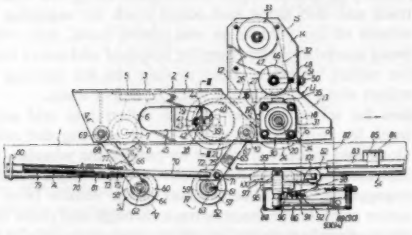
resiliently supporting a car body on the respective ends of respective bolsters, and slide means on said truck underlying said spring support means and slidably supporting the respective ends of said bolsters on said truck.

4,044,688

MONORAIL TRANSPORT APPARATUS

Kazuharu Kita, Kobe, Japan, assignor to Senyo Kiko Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1975, Ser. No. 642,404
Claims priority, application Japan, June 24, 1975, 50-78733
Int. Cl.[2] B61C *11/00*
U.S. Cl. 105—30 **5 Claims**



1. A monorail transport apparatus comprising a transport vehicle body provided with a caster wheel rollable on a monorail having upper and lower surfaces, a driving vehicle body partly received in and pivotally connected to the front portion of said transport vehicle body so as to be swingable around the axis of a transverse shaft, a driving wheel and a driven wheel disposed on opposite sides of said transverse shaft, an endless driving belt entrained around said driving and driven wheels and pressed against the upper surface of said monorail, and an auxiliary wheel pivotally connected to said driving vehicle body so as to be swingable around the axis of said transverse shaft and pressed against the lower surface of the monorail, the arrangement being such that the monorail transport apparatus is propelled along the monorail by means of the driving vehicle body which engages the monorail from above and below between said endless driving belt and said auxiliary wheel.

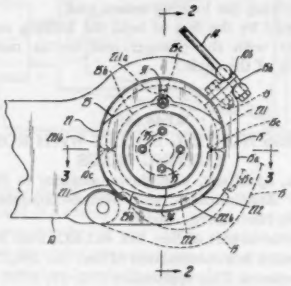
4,044,689

RESILIENTLY RAILWAY TRUCK SUSPENSION

Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Oct. 21, 1975, Ser. No. 624,368
Int. Cl.[2] B61F *5/30, 5/38, 5/52, 15/12*
U.S. Cl. 105—221 R **2 Claims**

1. A railway truck journal bearing mount comprising, in combination, a bearing assembly on an axle journal, elastomeric bushing means surrounding said bearing assembly, an inner retaining ring having elliptical end flanges with the major axis horizontal and dimensioned to embrace the ends of said bushing means, an outer retaining ring means for clamping said bushing means on said inner retaining ring, said bushing means having radial circumferential end flanges embraced within the flanges of the inner retaining ring, the elastomeric bushing means at the ends being more completely embraced at the sides than at the top and bottom, the flanges of the bushing means embracing the sides of the clamping ring means, the bushing means being thicker at the top than elsewhere, tapering toward the sides, the bushing means being thinner at the middle circumferentially than at the sides, the bushing means being divided into upper and lower segments meeting on a horizontal axial plane, said clamping ring means being divided into upper



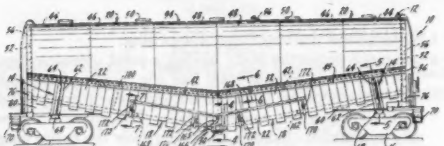
and lower parts along an inclined axial plane, the lower clamping ring part being hinged to the upper clamping ring part and being connected at the outer end to the upper clamping ring part at an elevation above the horizontal axial plane, said inner retaining ring having radial pins at the top projecting into holes in the upper bushing segment, said upper clamping ring part having an interior lug embraced on the sides and ends by concavities in the adjacent ends of the bushing segments, and said lower clamping ring part having an interior lug embraced on the sides and ends by concavities in adjacent ends of the bushing segments.

4,044,690

RAILWAY TANK HOPPER CAR

Ronald George Deeks, 1521 Warland Road, Oakville, Ontario, Canada

Filed Mar. 24, 1975, Ser. No. 561,143
Int. Cl.[2] B61D *5/00, 5/06, 5/08, 7/00*
U.S. Cl. 105—247 **8 Claims**



1. In a railroad tank car for use in handling dry bulk commodities including a pair of bolster assemblies secured to longitudinally spaced wheel truck assemblies for supporting the car, an improved car body structure mounted on and secured to said bolster assemblies, comprising:

a. a pair of V-shaped hopper sections sloping downwardly from each end of the car to meet at the center of the car, said hopper sections having side walls which increase in length as they extend towards the center of the car;

b. a pair of asymmetric truncated cone sections secured adjacent to the corresponding upper edges of each of said hopper sections and to each other at the center of the car, said cone sections having an increasing diameter as they extend toward the center of the car;

c. a pair of end sections secured adjacent the outer edges of said hopper section and said cone section;

d. a plurality of substantially vertical longitudinally spaced apart first stiffener members secured to the outer surfaces of said hopper section side walls;

e. longitudinally extending second stiffener members secured to said first stiffener members adjacent the intersection between said hopper sections and said cone sections; and

f. a plurality of substantially horizontal longitudinally spaced tie members which extend transversely across said hopper section and pass through said side walls for attachment at their respective ends to said second stiffener members.

4,044,691

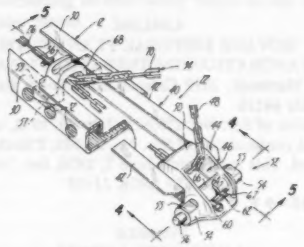
VEHICLE TIE-DOWN SYSTEM FOR RAIL CARS

Donald C. Kilgus, deceased, late of Grosse Point Woods, Mich., by Marjorie M. Kilgus, executrix, 1288 Fairholme Road, Grosse Point Woods, Mich. 48236

Filed July 8, 1976, Ser. No. 703,594

Int. Cl.[2] B60P *7/08*

U.S. Cl. 105—368 T **8 Claims**



1. A vehicle tie-down system comprising in combination, a transport, a vehicle supported on said transport and having front and rear ends, an idler body mounted on said transport at a position extending fore and aft of the vehicle, said idler body having a pair of ends, a tie-down member having ends and connected to said vehicle and operatively associated with said idler body so as to hold said vehicle on said transport, said idler body including at least two support portions located fixed distances apart, said tie-down member being connected intermediate the ends thereof to said vehicle and having a pair of diverging sections inclined downwardly therefrom in a direction fore and aft of said vehicle into sliding engagement with said support portions, and tensioning means connected directly to at least one end of said tie-down member operable to draw said sections cross said support portions so as to place tension forces in said tie-down member sections operable to pull said vehicle downwardly on said transport and to restrain forward and rearward movement of said vehicle on said transport while maintaining substantially the same inclination of said tie-down member sections.

4,044,692

RAILROAD CAR VEHICLE STOWING DEVICE

Robert Duane Cruthis, and Robert Samuel Mills, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 28, 1975, Ser. No. 626,381

Int. Cl.[2] B60P *3/06, 7/08;* **B61D** *3/02, 45/00*

U.S. Cl. 105—368 R **12 Claims**

1. A railroad flatcar securement apparatus for a wheeled vehicle comprising:

a plurality of wheel chocks;

means for securing said wheel chocks to said flatcar at positions fore and aft of the wheels of the vehicle and in contact therewith;

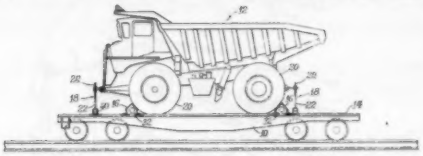
a plurality of tie rod members;

means for securing said tie rod members to the flatcar at positions respectively forwardly and rearwardly of the vehicle including at each position

an inverted channel-shaped bracket fixed laterally across the flatcar,

an elongate tapping rod inserted within said bracket, said tapping rod being rotatable on a lateral axis and being laterally movable within said bracket, said bracket having a portion cut away to expose a portion of said tapping rod, and

means for securing the lower end of at least one of said tie rod members to the exposed portion of said tapping rod so that said one tapping rod rotates within said bracket as said one tie rod member is pivoted relative to the



flatcar, said one tie rod member extending outwardly from said tapping rod with its upper end adjacent the vehicle when pivoted to an upright position, said one tie rod member thereby being laterally movable relative to the flatcar and pivotally movable toward a prone position on the bed of the flatcar; and

means for securing the upper ends of said tie rod members to the vehicle forwardly and rearwardly whereby said tie rod members are tensioned with the vehicle in position for transport to prevent movement of the vehicle in a direction away from the flatcar in excess of the tensioned position and whereby the wheels of the vehicle are retained against said wheel chocks at all times and under all railroad transport conditions.

4,044,693

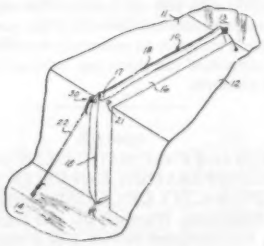
INFLATABLE DUNNAGE WITH TIE-DOWNS

John W. Ramsey, Jr., Benton, Ark., assignor to Guardpack, Incorporated, Sheridan, Ark.

Filed Mar. 12, 1976, Ser. No. 666,259

Int. Cl.[2] B61D *45/00;* **B65D** *57/00, 81/10;* **B65G** *1/14*

U.S. Cl. 105—468 **17 Claims**



1. An inflatable dunnage bag comprising:

multiple plies of puncture-resistant sheet material folded into a rectangular form with four corners and four edges, and inner and outer surfaces;

a pneumatically inflatable bladder contained within said bag adjoining said inner surface thereof; and

a tie-down device made of flexible plastic affixed to said plies of said bag and provided as an integral part of the bag, said tie down device comprising,

a first, enlarged anchor portion received within said bag, and

a second, enlarged loop portion attached to said anchor portion within said bag, bearing a loop at a distal end

thereof outside said bag, and having a reduced portion extending through the plies of the bag,

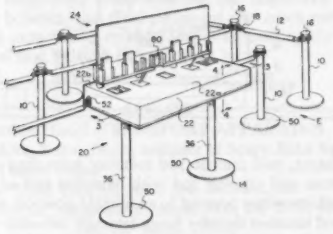
whereby said dunnage bag may be tied down in place by a rope through said loop to prevent shifting of the bag with respect to freight and a vehicle in which the bag is employed.

4,044,694

CHEQUE WRITING DESK AND CONTROL SYSTEM

Glenn John Wylie, 114 W. Deanepark Drive, Islington, Ontario, Canada

Filed Sept. 24, 1975, Ser. No. 616,252
Int. Cl.[2] A47B *41/04*
U.S. Cl. 108—28 **7 Claims**



1. A cheque writing desk unit for use in a customer control line rail system as a portion of such system, said system having a series of posts of predetermined height, and rail means interconnected therewith, the rail means having connection means thereon, said desk unit comprising;

a platform of predetermined length and width defining a working surface suitable for use by persons standing;

leg means supporting said platform at a suitable elevation and leaving a vacant space therebeneath between the platform and the floor whereby a person may stand close to the platform;

partition means extending upwardly from said platform, along the length thereof, and offset to one side to define a wider and a narrower portion of said platform on opposite sides of said partition means;

proper holder means on both sides of said partition means, and,

line rail interconnection means on at least one end of said platform, below the top surface of said platform, for interconnection with said rail means, whereby said rail means may be interconnected between a said post and said interconnection means in an essentially horizontal manner and freely supported therebetween, without applying tension to said platform.

4,044,695

MULTI-STAGE PNEUMATIC MUNICIPAL SOLID WASTE SEPARATION AND RECOVERY OF A PLURALITY OF CLASSIFICATIONS

Harold B. Mackenzie, Wheaton, Ill., and Ingvar G. Anderson, Dunedin, Fla., assignors to New Life Foundation, Wheaton, Ill.

Filed Feb. 27, 1976, Ser. No. 662,240
Int. Cl.[2] F23G *5/00*; F23K *1/00*
U.S. Cl. 110—8 P **21 Claims**

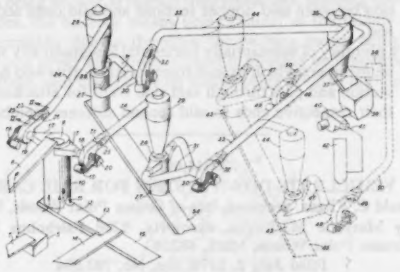
1. A system of municipal solid waste separation and fuel recovery, comprising:

effecting primary shredding of heterogeneous municipal solid waste;

pneumatically separating said primary shredded solid waste in a first-stage pneumatic separator into relatively light, low density combustible waste materials and relatively incombustible and high density waste materials;

pneumatically separating said first-stage combustible waste materials in at least one second-stage pneumatic separator into a relatively heavy density classification fuel fraction and a light density classification fuel fraction in a continuous processing operation;

transporting the relatively heavy density classification fuel fraction from said second-stage pneumatic separator; and



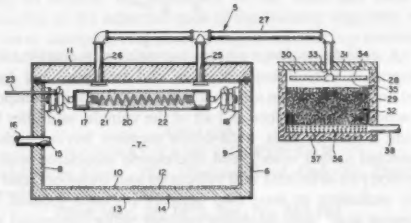
separately transporting the light density classification fuel fraction from the second-stage pneumatic separator.

4,044,696

SEWAGE DISPOSAL PLANT WITH EVAPORATION/INCINERATION MEANS

Frank M. Marincek, 2019 Campus Road South Euclid, Cleveland, Ohio 44121

Continuation of Ser. No. 273,401, July 20, 1972, abandoned, which is a continuation of Ser. No. 23,601, March 20, 1970, abandoned. This application June 7, 1976, Ser. No. 693,485
Int. Cl.[2] A47K *11/02*
U.S. Cl. 110—9 E **12 Claims**



3. A batch method of sewage disposal in a building such as a home or apartment, comprising:

a. feeding a batch of raw human sewage, including feces and urine, deposited in a plumbing fixture in the building, into the confined chamber of a tank located remote from the plumbing fixture, the tank having a removable top for sealing the chamber and a heater means disposed in the upper portion of the chamber free of the removable top;

b. heating the batch of sewage with the heater means to evaporate water of said batch and further to incinerate solid material of said batch remaining after evaporation of the water, so as to produce a powdery residue therefrom;

c. removing the water vapor from the chamber and feeding it to a condenser means comprising (I) an inlet through which water vapor enters the condenser means, (II) an outlet through which condensed water vapor exits from the condenser means, and (III) a quantity of particulate material sufficient to condense water vapor from said batch by absorbing heat thereform;

d. withdrawing and disposing of water exiting from the outlet of the condenser means; and

e. withdrawing and disposing of powdery residue in the tank.

9. A batch system of sewage disposal in a building such as a home or apartment, comprising:

a. a closed tank coupled by piping to at least one plumbing fixture in which a batch of raw human sewage, including

feces and urine, is deposited, the tank located remote from the plumbing fixture and including a confined chamber for containing said batch of sewage and a removable top for sealing the chamber from the ambient atmosphere;

b. heater means mounted in the chamber in an upper portion thereof free of the removable top, the heater means functioning to evaporate water of the sewage and further to incinerate solid material of the sewage remaining after evaporation of the water, so as to produce a powdery residue therefrom;

c. inlet means cooperating with the tank and functioning to feed said batch of sewage from said piping into the chamber;

d. vapor outlet means cooperating with the tank and functioning to remove water vapor from the chamber;

e. means for condensing the water vapor, including (I) an inlet through which water vapor enters the condenser means, (II) an outlet through which condensed water vapor exits from the condenser means, and (III) a quantity of particulate material sufficient to condense water vapor from said batch by absorbing heat therefrom; and

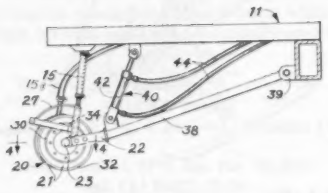
f. conduit means cooperating with the vapor outlet means and functioning to feed water vapor to the inlet of the condenser means.

4,044,697

NO TILL SEED DRILL

Morton C. Swanson, P.O. Box 214, Palouse, Wash. 99161

Filed Apr. 28, 1975, Ser. No. 571,947
Int. Cl.[2] A01C *5/08;* A01B *63/00*
U.S. Cl. 111—66 10 Claims



1. A tractor drawn no till seed drill for planting seeds in previously harvested plots that have not since been tilled with the seeds being evenly spaced along a furrow formed in the stubble ground, while moving in a forward direction, comprising:

a wheel supported framework;

a hopper on said framework for receiving seeds in bulk;

a seed delivery tube extending downwardly from said hopper to an open end;

a coulter disc operatively connected to said framework for rotation about a first axis;

a furrow opening disc operatively connected to said framework for rotation about a second axis inclined to and rearward of said first axis with said furrow opening disc tangentially engaging said coulter disc at a point of convergence elevationally below said first and second axes; and

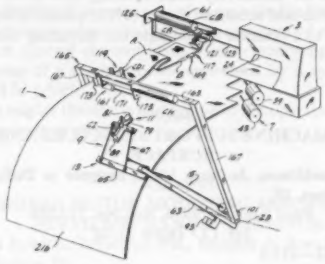
wherein said seed delivery tube open end is located directly above said point of convergence.

4,044,698

APPARATUS FOR JOINING PLIES OF MATERIAL SUCH AS TEXTILE FABRIC

William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Brookhaven, Miss.

Filed July 16, 1976, Ser. No. 705,897
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 29 Claims



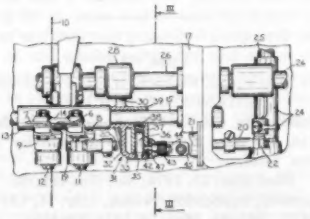
1. Apparatus for joining plies of material such as textile fabric comprising means for seaming the plies together along an edge thereof, means for feeding the plies through the seaming means, and contour guide means for shifting the plies as they are fed forward by the feeding means to effect contour seaming of the plies, wherein the improvement comprises the provision of means for controlling the feed of the plies, said control means comprising a control clamp for clamping the plies as they are fed forward and means mounting said control clamp for movement with the plies as they are fed forward, and loading means adapted, while one assembly of plies is being fed through the seaming means, to receive the next assembly of plies to be seamed and operable upon completion of seaming of the said one assembly to enter the next assembly in the seaming means and in said control clamp.

4,044,699

DEVICE FOR TILTING SEWING MACHINE HOOKS TO FACILITATE THREADING

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Sept. 8, 1976, Ser. No. 721,621
Claims priority, application Italy, Sept. 23, 1975, 27523/75
Int. Cl.[2] D05B *57/02*
U.S. Cl. 112—200 5 Claims



1. A device for tilting the hooks within the base of a sewing machine of the type having needles operatively associated with the hooks for forming chain stitches, said device comprising:

a. a hook supporting shaft (15) oscillatably supported within the base of the sewing machine;

b. a lever member (31) pivotally mounted on said hook supporting shaft which includes:

i. an arm (32) having a segment (33) formed on the free end thereof, said segment being concentric to said hook

supporting shaft (15) and including means on the inner surface thereof defining a radial bore (34);

c. actuating means (37) fixed on said hook supporting shaft in operative association with said lever member;

d. a pin (36) slidably carried by said actuating means for connecting said lever member (31) with said actuating means (37) to effect oscillating movement of said hook supporting shaft (15); and

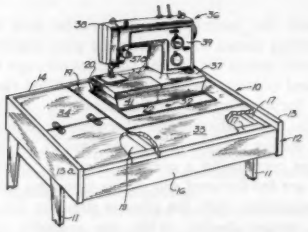
e. means for selectively disconnecting said lever member (31) from said actuating means (37) to permit tilting of the hooks to a position to facilitate the threading thereof.

4,044,700

SEWING MACHINE SUPPORT STRUCTURE AND WORK SURFACE

Eugene Aeschliman, Jackson, Miss., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Sept. 10, 1976, Ser. No. 722,016
Int. Cl.² D05B 75/02
U.S. Cl. 112—217.1 **7 Claims**



1. A support structure for a sewing machine comprising a frame supported on a plurality of legs, said frame including a pair of horizontal support members, a first horizontal panel member slidably supported on said support members, a sewing machine supported on said first horizontal panel member, a second horizontal panel member removably supported on said support members contiguous to said first panel member and coplanar therewith, said first and second panel members constituting the work surface of said support structure, said first panel member and said member being selectively slidable on said support members to position said machine in in-use or out-of-use positions with said second panel member being disposed either rearwardly or forwardly in relation to said first panel member.

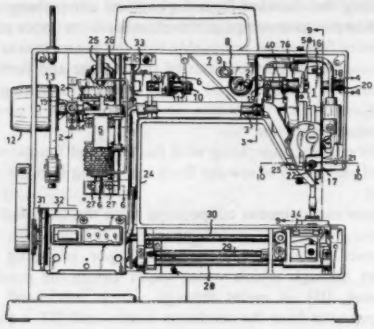
4,044,701

SEWING MACHINE FRAME WITH PRESSER FOOT AND NEEDLE BAR UNIT

Hannes Giesselmann, and Karl Ingvar Fredrik Rendahl, both of Huskvarna, Sweden, assignors to Husqvarna Aktiebolag, Huskvarna, Sweden

Filed Mar. 15, 1974, Ser. No. 451,706
Claims priority, application Sweden, Mar. 16, 1973, 7303690; Mar. 16, 1973, 7303691; Mar. 16, 1973, 7303692
Int. Cl.² D05B 73/02
U.S. Cl. 112—259 **5 Claims**

1. A sewing machine including a body having an open rear portion, an arm, precast seats in the body, a presser foot and needle bar unit, a thread tension device and a top shaft unit, means fastening said unit and device in said seats in the body, the presser foot and needle bar unit being provided with a presser foot mechanism and a needle bar holder, and being defined by an elongated frame having ends, points of attachment at both ends, said points of attachment comprising means providing a range of adjustment for setting of the position of the presser foot and needle bar unit in the arm in at least one



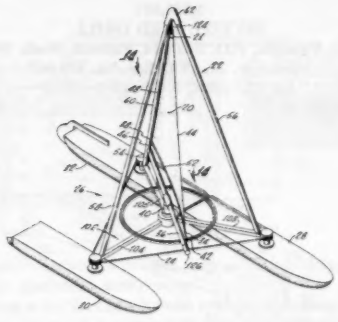
direction at a right angle to the longitudinal direction of the elongated frame.

4,044,702

HIGH EFFICIENCY AERODYNAMIC SAIL SYSTEM FOR BOATS, AND METHOD FOR SAILING

Robert S. Jamieson, 411 N. Bush, Anaheim, Calif. 92805

Filed Oct. 21, 1974, Ser. No. 516,166
Int. Cl.² B63H 9/04
U.S. Cl. 114—102 **39 Claims**



1. A high efficiency aerodynamic sail system, comprising:

a. a sail having a luff, a leech, a head and a foot,
said sail having a center of area at, or below, mid-height,

b. means for supporting said sail,
said supporting means being adapted to suspend said sail from every corner,
said supporting means being adapted for mounting on a sailing craft,
said supporting means including means to adjust the angle between said sail and said sailing craft while sailing, and to maintain said angle independently of the strength of the incident wind,

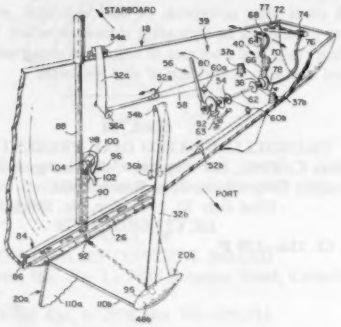
c. means for causing the luff-to-leech airfoil chords of said sail to be virtually parallel each with the others when said sail is generating an aerodynamic lift force,
said means for causing the luff-to-leech airfoil chords of said sail to be virtually parallel with each other when said sail is generating an aerodynamic lift force being capable of adjustment while said sail is in use, and,

d. means for connecting said sail to said means for matching the leeward deflections of said luff and leech.

4,044,703
SAILBOAT CONTROL APPARATUS

Joel Kurtz, Box 26, Damascus, Pa. 18415

Filed Aug. 25, 1976, Ser. No. 717,638
Int. Cl.[2] B63B *41/00*
U.S. Cl. 114—143 8 Claims

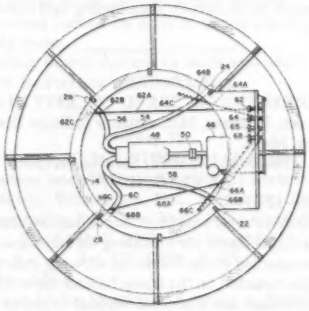


1. In a boat, attitude control apparatus comprising: first and second weighted keels pivotally mounted to a medial point on the underside of said boat for independent rotation about a common longitudinally directed axis; first and second flexible line means upwardly directed along opposite external sides of said boat; the lower ends of said first and second line means being connected respectively to said pair of keels for supporting said keels at variable angles with respect to the vertical; first and second independently moveable controls within said boat; and means within said boat coupling each of said first and second controls to the upper ends of each of said first and second line means for selectively taking up or letting out said first and second line means in response to movement of said first and second control means in a manner that movement of only said second control varies the angle between said keels but maintains the orientation of the bisector of said angle substantially constant and that movement of only said first control varies the angular orientation of said bisector while maintaining the angle between said keels substantially constant.

4,044,704
SAUCER BOAT

Gerald R. Miller, R.R. No. 4 Box 64A, Arkansas City, Kans. 67005

Filed June 28, 1976, Ser. No. 700,316
Int. Cl.[2] B63H *11/04*
U.S. Cl. 115—12 R 6 Claims



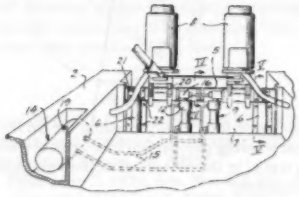
1. In a circular boat, apparatus for controlling the direction comprising;

a. a power source and liquid pump;
b. a plurality of pipes supplied with high pressure, high velocity liquid from said pump through valve means;
c. said pipes directed through the wall of said boat below the water line in selected directions;
whereby by controlling the flow of said high velocity liquid through one or more of said pipes, said boat can be controlled to move in a selected one of a plurality of predetermined directions and wherein
d. each of said pipes has a valve near its discharge end;
e. each valve controlled by a separate control element;
f. each control element being a lever operating a valve by means of a tension means restrained by a spring means; and in which
g. the engine throttle is responsive to the operation of at least one control element.

4,044,705
OUTBOARD MOTOR MOUNTING ASSEMBLY AND SERVO MECHANISM THEREFOR

William Roberts, Tavernier, Fla., assignor to Ross D. Siragusa, Barrington, Ill.

Filed Mar. 25, 1976, Ser. No. 670,431
Int. Cl.[2] B63H *5/12*
U.S. Cl. 115—41 HT 1 Claim



1. An outboard motor mounting assembly for use on a boat to be powered by outboard-type motors and/or engines, comprising
an assembly body,
an auxiliary transom carried by said body and having a selected width to conform with a width dimension of a transom of said boat, said auxiliary transom positioned on an outside of said boat transom and having an inner vertical face aligned with an outer vertical face of said boat transom,
interlocking guide rail means including a pair of support members having a top horizontal portion with an outer end thereof secured to a top inner side of said auxiliary transom and a vertical slide portion having a top end carried by an inner end of said horizontal portion, one each of said members positioned along each outer vertical edge of said auxiliary transom, and a pair of elongated C-shaped channels secured to an inner face of said boat transom and positioned to receive, in a telescoping relationship, one each of said vertical slide portions of said support member respectively,
raising and lowering means including,
two spaced hydraulic lifting cylinders secured to said inner face of said boat transom and vertically positioned to provide a mounting space for said outboard motor between said cylinders and said interlocking guide rail means,
piston means carried by each cylinder and limited to a 3¾ inch stroke, said pistons having top ends joined to a horizontal collar, and
an elongated horizontal lifting bar disposed in said collars and supported by brackets attached along said top edge of said inner face of said auxiliary transom between said collars and at ends of said bar, respectively,
a fluid pumping means operatively connected to said lifting cylinders to allow a user, from a remote location,

to selectively move said top edge of said transom from a deep water position wherein said top edge proximately aligns with a top edge of a boat transom to a shallow water position proximately 3½ inches thereabove,

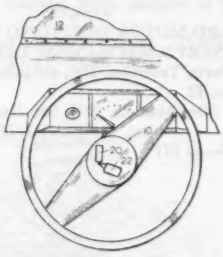
wherein motors carried by said auxiliary transom can be selectively moved from a deep water, high speed configuration to a shallow water, slow speed configuration without affecting cavitation during operation.

4,044,706

TRAILER DIRECTION INDICATOR

Chester C. Gill, 950 Colorado Ave., A-27, Stuart, Fla. 33494

Filed Oct. 22, 1976, Ser. No. 734,722
Int. Cl.² B60Q 1/42
U.S. Cl. 116—31 7 Claims



1. A trailer guide for visually assisting the driver in manually operating the steering mechanism of a vehicle-trailer combination during travel in the reverse direction, said guide comprising in combination:

frame means for being coupled to the steering mechanism of the vehicle, said frame means having a first pivot thereon for being laterally displaced responsive to the movement of the steering mechanism, with said frame means having further a second pivot thereon spaced from and relatively below said first pivot;

a first elongated indicator rotatably coupled adjacent a first end thereof about said first pivot; and

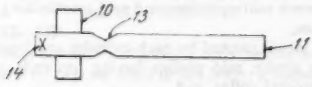
a second elongated indicator movably coupled along the longitudinal axis thereof to said second pivot for rotating therearound, with a first end of said second elongated indicator being movably coupled to a second end of said first elongated indicator, whereby a movement of the steering mechanism causes a gravitationally induced rotational displacement of said first and second longitudinal indicators about said first and second pivots for indicating to the vehicle operator the expected direction of travel of the trailer to the steering commands.

4,044,707

INTERRUPTIBLE TIME-TEMPERATURE INDICATOR

Charles H. Byrne, Pearl River, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed June 5, 1975, Ser. No. 583,942
Int. Cl.² G01K 11/06; G01D 1/00
U.S. Cl. 116—114.5 8 Claims



1. A time-temperature indicator comprising: a fluid source and an interruptible wick in contact with said fluid source upon activation of said time-temperature indicator, said wick being interruptible through severance at a weakened area after activation of said indicator, and said fluid source containing an indicating substance which has a defined melting range and a set rate of migration along said wick when melted and after activation of said indicator.

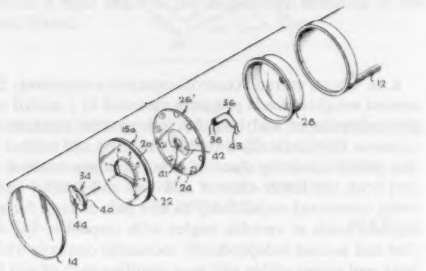
6. A time-temperature indicator comprising: a fluid source and an interruptible wick in contact with said fluid source upon activation of said time-temperature indicator, said wick being interruptible through severance by a cutting device incorporated on it after activation of said indicator, and said fluid source containing an indicating substance which has a defined melting range and a set rate of migration along said wick when melted and after activation of said indicator.

4,044,708

TRANSILLUMINATED DIAL PRESENTATION

Herman C. Klein, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed July 23, 1975, Ser. No. 598,183
Int. Cl.² G01D 11/28
U.S. Cl. 116—129 P 25 Claims



1. An indicator dial system for instruments, which comprises a display of an instrument dial face in the form of a developed photographic film or a reverse silk screened presentation of said instrument dial face, a light diffuser element, said display of an instrument dial face being mounted on one side of said diffuser element, a high light transmission element mounted on the other side of said diffuser element and supporting same, a light source spaced from and positioned on the opposite side of said high light transmission element from said diffuser element, said light source comprising light emitting diode means, means supporting said light emitting diode means in spaced relation to said light transmission element, and reflector means at the rear of said light transmission element for backlighting said instrument dial face display, said reflector means being positioned to reflect light from said light emitting diode means through said light transmission element to said diffuser element, said diffuser element diffusing the light received from said high light transmission element for uniformly illuminating said instrument dial face display.

4,044,709

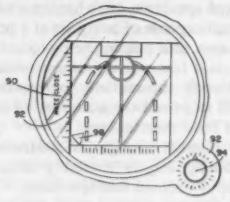
OMNIDIRECTIONAL SPEED COCKPIT DISPLAY

David L. Green, Potomac, Md., assignor to Pacer Systems, Inc., Burlington, Mass.

Filed Sept. 29, 1975, Ser. No. 617,590
Int. Cl.² G01D 7/04
U.S. Cl. 116—129 F 21 Claims

1. Helicopter cockpit omnidirectional display comprising an indicator having a frame for mounting on an instrument panel, a window connected to the frame for viewing indicator movements, a plate mounted on the frame behind the window, a first horizontal crossbar and a second vertical crossbar positioned between the plate and the window for movement across the plate in orthogonal directions, means connected to the crossbars for independently moving the crossbars to indicate speeds in lateral directions with the vertical crossbar and in forward

and rearward directions with the horizontal crossbar, and a zero center indicator on the plate, the improvements comprising a zero indication being centered horizontally on the plate



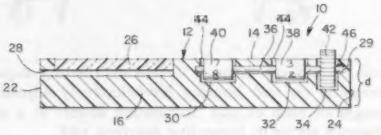
and being offset vertically on the plate to provide a greater range of speed indications in a forward direction than in a backward direction.

4,044,710

INVENTORY CONTROL BOARD

Richard Hansen, Rte. No. 1 - 9826 Sherman Road, Cedarburg, Wis. 53012

Filed Apr. 9, 1976, Ser. No. 675,314
Int. Cl.[2] G09F *11/24*
U.S. Cl. 116—133 **2 Claims**



1. An inventory control board comprising:
a housing having top, bottom, front, rear and side walls, a portion of said top wall adjacent one of said side walls being provided with a series of transparent sections which are in spaced relation between said front and rear walls;
a plurality of slots formed in one of the side walls of said housing beneath each one of said transparent sections, each of said slots being open at said one side wall and extending inwardly of the housing therefrom to respectively receive indicia-bearing cards visually inspectable through said transparent sections;
a plurality of shafts rotatably mounted in said housing, each of said shafts being spaced laterally from and in longitudinally aligned relation with a different one of said slots;
a plurality of indicia-bearing drums carried by each of said shafts;
a series of windows formed in the top wall of said housing located respectively above said drums so as to provide visual access to the indicia carried thereon;
a thumbwheel carried by each of said shafts for selectively rotating same;
and a spring detent carried by each said shaft adapted to prevent inadvertant rotation thereof.

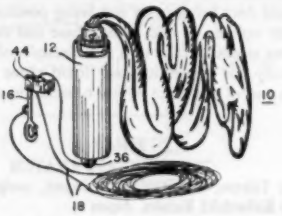
4,044,711

AERIAL DISTRESS MARKER

Leon L. Jamison, late of Wilmington, Del., by Barbara A. Jamison administratrix, Wilmington, Del., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 9, 1976, Ser. No. 656,620
Int. Cl.[2] G09F *21/06*
U.S. Cl. 116—124 B **2 Claims**

1. A distress kit for location of a person in distress by means of an inflatable balloon attached to the kit, comprising
an inflatable balloon joined to a cylinder of pressurized gas of a density less than air,
an anchor unit, and
a flexible line joining the cylinder to the anchor unit, in which
a quantity of fine metallic powder is located in the interior of the balloon, to serve as a radar marker when the balloon is inflated with the pressurized gas and the powder is dispersed throughout the balloon, and in which
the anchor unit is formed of a member fitted with
a first fastening means adaptable for fastening to an end of the flexible line,



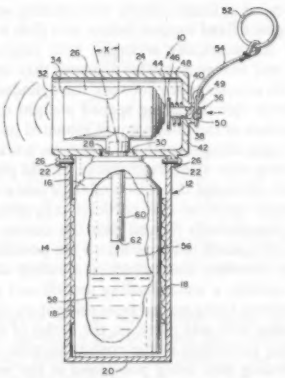
a second fastening means adaptable for clasping to an object apart from the assembly, and a third fastening means comprising means for clamping, under spring bias, a section of the line passing through the third fastening means, and third fastening means fitted with gripping means to permit manual adjustment of he clamping force of the said means about said section of the line.

4,044,712

PRESSURIZED FLUID POWERED HORN

Manuel Goodman, and Boubene M. Jaremus, both of 3410 N. Lake Shore Drive, Chicago, Ill. 60657

Filed May 7, 1976, Ser. No. 684,287
Int. Cl.[2] G08B *3/00*; G10K *9/00*
U.S. Cl. 116—142 FP **1 Claim**



1. A pressurized fluid powered audible alarm device comprising: a housing; a container of pressurized fluid mounted in said housing, said container having a deflection responsive valve and outlet member projecting therefrom for selectively dispensing said pressurized fluid from said container through said valve and outlet member in response to displacement of said valve and outlet member in a predetermined direction; a horn mounted on said outlet member for receiving said pressurized fluid; said horn being excited to sound in response to pressurized fluid passing through said horn; said horn receiving pressurized fluid in response to displacement of said horn relative to said housing in said predetermined direction and consequent deflection of said valve and outlet member; a plunger carried slideably by said housing proximate said horn and being positioned for selectively approaching said horn

from a direction opposite said predetermined direction; spring means acting between said plunger and said horn for urging said plunger to contact and displace said horn in said predetermined direction; removeable means for retaining said plunger spaced from said horn against the urging of said spring means; said removeable means including a pull ring to facilitate rapid removal of said removeable means; said pressurized fluid in said container having a liquid phase and a gaseous phase; a tubular intake duct within said container; one end of said duct being connected to said valve and outlet member, the other end of said duct being open and being positioned in said container; the volume of said liquid phase and the length of said duct being selected to be of a preselected volume and length, respectively, for preventing said liquid phase from contacting the open end of said duct in any orientation of said device.

4,044,713

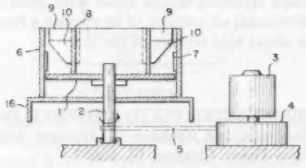
TUMBING APPARATUS

Muneaki Takase, Kita-Ooizumi, Japan, assignor to Zenyaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 444,056, Feb. 20, 1974, Pat. No. 3,968,277. This application Aug. 29, 1975, Ser. No. 608,988

Int. Cl.² B05C *3/08;* A61D *3/06*

U.S. Cl. 118—19 **3 Claims**



1. Apparatus for coating solid particles with a digestive tracts-soluble film comprising a horizontally disposed rotary disk, an outer cylinder clearly surrounding said disk and supported upon a fixed support below said disk, a stationary inner cylinder concentrically arranged with respect to said outer cylinder and having a smaller diameter than the outer cylinder to form an annular space between the cylinders, the lower end of the inner cylinder being spaced a slight distance from the upper surface of the disk, a cover mounted on the upper cylinder and supporting a coating liquid pipe, a water feeding pipe, a ventilating pipe and an exhaust pipe, said pipes being spaced from each other and the outlets of all of said pipes opening into said annular space so that particles supported on said rotary disk are sequentially moved past the outlets of said pipes, a plurality of spaced-apart partitions are positioned in the annular space between the cylinders dividing said space into a coating section, a water feeding section and a drying section, said partitions being spaced from said rotary disk and in sealing relationship with said particles, the outlet of the coating liquid pipe being positioned in the coating section, the outlet of the water feeding pipe being positioned in the water feeding section and the outlets of the ventilating and exhaust pipes being positioned in the drying section, and means for rotating said disk.

4,044,714

FOOD PRODUCT COATING APPARATUS

Richard E. Jones, and Donald F. Jago, both of Duluth, Minn., assignors to Jeno's, Inc., Duluth, Minn.

Filed Oct. 2, 1975, Ser. No. 618,905

Int. Cl.² B05B *3/02*

U.S. Cl. 118—24 **16 Claims**

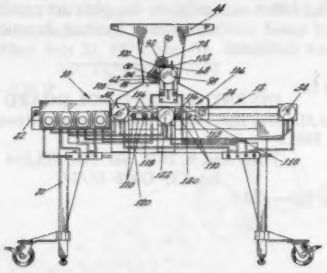
1. Apparatus for coating an article of food with a granular food product at a selected density, said apparatus comprising

means for transporting an article of food to be coated along a preselected path at a predetermined speed;

a granular food product distributor comprising

a housing positioned above said transporting means for storing granular food product to be coated on an article of food, said housing including means defining a pair of parallel elongated apertures, each having a variable cross-sectional area and capable of being set at a predetermined cross-sectional area, said housing being located in a spaced position above said transporting means with said pair of apertures positioned substantially perpendicular to the preselected path to permit the transporting means to pass a said article of food thereunder;

a pair of axially aligned, contiguous contrarotatable food product distributing augers rotatably mounted in said housing one above each of said apertures;



means operatively coupled to said distributing augers and mounted on said housing for selectively adjusting the height of each of said distributing augers at a selected distance above its respective aperture; and

rotating means operatively coupled to each of said distributing augers for rotation thereof at a variable selected speed, said distributing augers during rotation thereof being capable of delivering a metered quantity of granular food product through each of said apertures at a predetermined rate to coat the surface of an article of food with a metered density of granular food product as said transporting means transport said article of food along said preselected path and under said pair of parallel elongated apertures.

4,044,715

APPARATUS FOR MANUFACTURING CUSHION MATERIALS

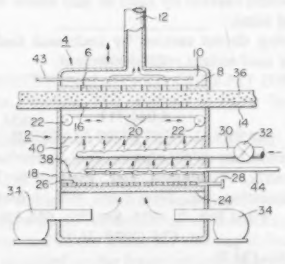
Muneharu Urai; Koji Kogure, and Youichiro Haraguchi, all of Tokyo, Japan, assignors to Takeji Saitoi, Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,175

Claims priority, application Japan, Sept. 17, 1974, 49-105981

Int. Cl.² B05C *19/02*

U.S. Cl. 118—50 **8 Claims**



1. An apparatus for manufacturing a cushion material including a hollow body, a table disposed on said body and formed with apertures of predetermined shape, a hollow upper cover member movable toward and away from said table, and a plate

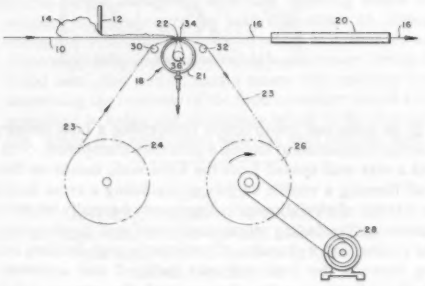
closing the lower end opening of said upper cover member and formed with apertures of the same shape as that of said apertures of said table and aligning with the latter, said table and said plate being adapted to hold a sheet of foamed material of continuous cell structure therebetween during impregnation of a fine powdery welding material into said foamed material through said aligned apertures, said apparatus comprising a porous member disposed within said body, means for supplying air under relatively low pressure from beneath said porous member thereby providing a cloud-like floating layer of said fine powdery welding material above said porous member, and conduit means extending into the zone of said cloud-like floating layer for jetting a gas under high pressure into said cloud-like floating layer for jetting a gas under high pressure into said cloud-like floating layer thereby forceably carrying said fine powdery welding material in said cloud-like floating layer toward said apertures of said table by the gas under high pressure.

4,044,716

VACUUM SLOT COATING APPARATUS

Dennis L. Riddle, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 6, 1976, Ser. No. 683,728
Int. Cl.[2] B05C *11/08;* **A47L** *5/38*
U.S. Cl. 118—50 **3 Claims**



1. In a apparatus to provide a coated fabric having means to coat a fabric, suction conduit means having an elongated opening thereon to apply suction pressure to the fabric to impregnate the coating into the fabric and means to cure the coated fabric the movement comprising: guide means mounted inside said conduit means to guide a web material across one side of said elongated opening into said suction conduit means and out across the other side of said elongated opening to clean the surface of said opening, said opening being lined with a friction resistant material.

4,044,717

APPARATUS FOR COATING A SURFACE WITH A PULVERULENT PRODUCT

Roger Provost, Louveciennes, France, assignor to Institut Francais du Petrole, France

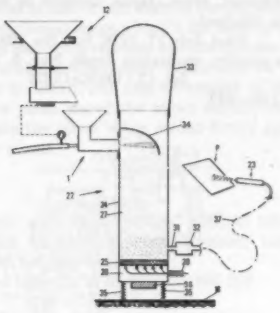
Filed June 9, 1976, Ser. No. 694,337
Claims priority, application France, June 18, 1975, 75.19299
Int. Cl.[2] B05B *5/02*
U.S. Cl. 118—629 **27 Claims**

1. An apparatus for depositing a homogeneous layer of a pulverulent product onto the surface of an object, comprising in combination:

treating means for subjecting the pulverulent product to a sudden pressure drop to produce a pulverulent fluid containing solid particles of the pulverulent product suspended in a carrier gas,

a storage chamber for receiving the pulverulent fluid, said chamber communicating with said treating means,

means for spraying said particles of the pulverulent fluid, said spraying means being connected to said chamber through a conduit, and



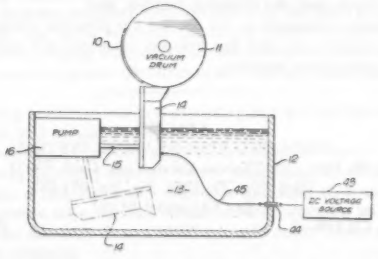
means controlling the flow of pulverulent fluid in said conduit.

4,044,718

ELECTROSTATIC FOUNTAIN DEVELOPER

Stephen D. Blake, North Hollywood; Emil M. Kaegi, La Canada; Eric P. Muntz, Pasadena, and Murray S. Welkowsky, Chatsworth, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Sept. 10, 1976, Ser. No. 722,090
Int. Cl.[2] G03G *15/10*
U.S. Cl. 118—647 **11 Claims**



1. A toner fountain for an electrostatic image developer having means for moving a receptor past the fountain and a pump for delivering liquid toner to the fountain, the improvement comprising in combination:

a base having a receptacle for liquid toner;

pool means carried at the upper end of said base defining a pool of liquid toner for wetting the receptor, with a flow passage from said receptacle to said pool,

said pool means including spaced end members and spaced side members of electrical insulating material, with liquid entering said pool through an entrance slot at the bottom thereof; and

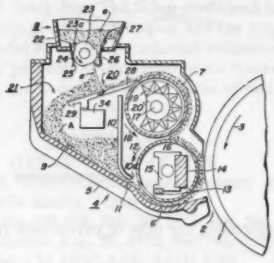
an electrode positioned in said pool bottom between said end members, with an electrical insulating bottom member positioned between said entrance slot and said electrode for horizontal fluid flow from said slot across said bottom member so that the liquid toner moving upward from said receptacle through said slot to said pool changes flow direction over said bottom member.

4,044,719

DEVELOPING APPARATUS IN ELECTRO-COPYING MACHINES

Hitoshi Ohmori, Mino, Japan, assignor to Rank Xerox Ltd., London, England

Filed July 27, 1976, Ser. No. 709,034
Claims priority, application Japan, Nov. 6, 1975, 50-132429
Int. Cl.[2] G03G *15/08*
U.S. Cl. 118—652 2 Claims



1. An improved developing apparatus for transporting developer from a reservoir past a photoreceptor to develop electrostatic latent image on the latter, the apparatus including:

a magnetic roller mounted adjacent the photoreceptor,

a stripping member extending away from the magnetic roller and downwardly toward the reservoir for stripping excess developer from the magnetic roller and returning it to the reservoir, the stripping member including a first flat plate having one edge located immediately adjacent the magnetic roller, a second flat plate, and means biasing the plates into contact with each other to form a continuous surface inclined downwardly from the magnetic roller toward the reservoir whereby excess developer is returned to the reservoir,

means located above the stripping member for dispensing toner onto the stripping member, and

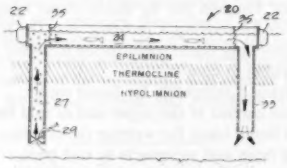
means connected to the second flat plate for vibrating the latter to stir and mix stripped developer and newly supplied toner together.

4,044,720

FLOATING FISH REARING SYSTEM

Arlo W. Fast, 1024 Moreno Drive, Ojai, Calif. 93023

Filed Mar. 29, 1976, Ser. No. 671,052
Int. Cl.[2] A01K *63/00*
U.S. Cl. 119—3 15 Claims



1. A floating fish rearing system comprising:

a. a floating frame structure having float means for maintaining said frame structure in a stable position on the surface of a water body;

b. fish confining raceway means within said floating frame for defining at least one area of shallow depth near the water surface;

c. upwelling means associated with said floating frame for supplying water from a deeper cold water zone within the water body up to the area defined by the fish confining means;

d. means associated with the upwelling means for pumping water upwardly through the upwelling means; and

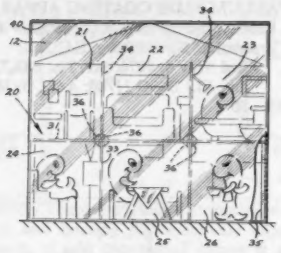
e. discharge means associated with said floating frame and operatively connected to said fish confining means at a position which is downstream of said upwelling means whereby water flows from the upwelling means through the fish confining means and out the discharge means.

4,044,721

FISH TANK CONSTRUCTION

Charles F. Foley, 3908 Merriam Road, Minnetonka, Minn. 55343, and Lewis J. Halberstadt, Conway Road, Williamsburg, Mass. 01060

Filed Apr. 5, 1976, Ser. No. 673,376
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 15 Claims



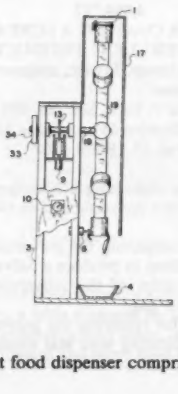
1. In aquarium construction comprising a tank defining an interior compartment having a generally transparent front wall and a rear wall spaced from the front wall, means on the rear wall forming a visable backdrop simulating a cross section of an interior of a building including rooms normally inhabited by humans and including representations of wall dividers between the rooms, and a plurality of removable wall dividers extending between the front and rear walls of said aquarium and having edges generally aligning with the representations of wall dividers of the backdrop, said removable wall dividers having substantial unobstructed openings therethrough to permit fish passage through all of the removable wall dividers.

4,044,722

TIMED PET FOOD DISPENSER

John O. Bradshaw, Rte. 1, Box 117-F, New Canton, Va. 23123

Filed Aug. 13, 1976, Ser. No. 714,087
Int. Cl.[2] A01K *5/02*
U.S. Cl. 119—51.13 2 Claims



1. A timed pet food dispenser comprising:

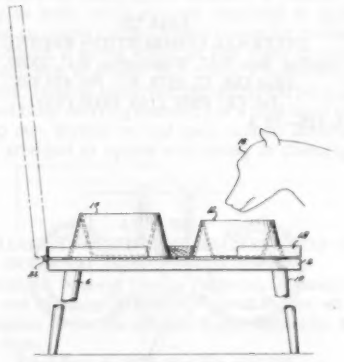
a dispenser stand,
a dispensing wheel rotatably mounted for rotation in a vertical plane about a horizontal shaft mounted on said stand,
a dispenser cover enclosing said dispensing wheel having a food drop opening at the bottom portion thereof and a top access opening therein for removing, cleaning, filling and replacing said food containers,
a plurality of insulated food containers rigidly mounted on said dispensing wheel in the vicinity of the periphery thereof and adapted to be removed therefrom by a twisting motion,
an indexing means for indexing said dispensing wheel to a plurality of positions corresponding to the location of said food containers mounted thereon and to advance said food containers to a dispensing position,
a container cover hingedly attached to each of said food containers,
a trip lever for holding each of said container covers in a closed position and adapted, when tripped in said dispensing position, to permit said associated container covers to open and permit the contents of said associated food container to fall by gravity into a pet eating area,
a 24-hour time clock settable to a predetermined time for feeding,
an actuating means for tripping the trip lever of said food container located in said dispensing position whereby the container cover of said food container is permitted to open and any food contained therein permitted to be dispensed therefrom by gravity, and
solenoid means associated with said indexing means and adapted to be actuated by said time clock to advance sequentially said food containers one at a time to said dispensing position, said solenoid's movement being delayed until after said actuating means trips said trip lever dispensing the contents of the food container before being permitted to index said dispensing wheel to the next position where it is maintained until the next feeding time.

4,044,723

ANIMAL FEEDING APPARATUS

Robert E. Fitzpatrick, 27 Lyle Terrace, Malden, Mass. 02148

Filed Sept. 1, 1976, Ser. No. 719,612
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—61 **2 Claims**



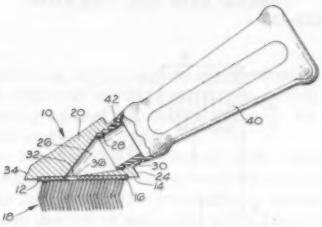
1. A dog feeding apparatus comprising a table member having a top section of rectilinear shape and a plurality of legs attached to the underside of the top section for supporting said top section in a horizontally disposed position and at a raised feeding level recommended by veterinarians for feeding large dogs of the mastiff breed, said legs being arranged in angularly opposed relationship at two opposite ends of the top section and projecting outwardly to encompass a floor area greater than the area of the top section and to resist overturning during a feeding by a large dog of the mastiff breed, container means slideably disposed at the upper section of the top section, said container means including inner generally circular food receptacle means and outwardly tapering side portions terminating in bottom flange portions, a cover member, hinge means for attaching the cover at one of said ends of the top section, said cover having a rectilinear shape which is the same as the shape of the top section and being recessed to form circular aperture means through which the container means may be received when the cover is closed, the axes of turning of the hinge means lying in a plane above the upper surface of the top section to position the cover when closed firmly against the container flange means.

4,044,724

GROOMING AND DISPENSING BRUSH HEAD

Geoffrey Leonard Merchill, Solihull, England, assignor to Hindes Limited, Shirley, England

Filed May 13, 1976, Ser. No. 686,059
Int. Cl.[2] A01K *13/00*
U.S. Cl. 119—83 **7 Claims**



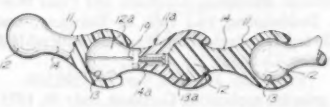
1. A powder-dispensing brush head comprising a body having first and second angularly related faces, a plurality of relatively stiff bristles distributed over a sheet connected with said first face, a single powder outlet in said first face and said sheet, a powder inlet in said second face, and at least one coupling formation connecting the brush head to a flexible-walled powder container with the mouth of the latter in registry with said inlet, wherein the improvement comprises a passageway leading from said inlet and having only one outlet orifice coinciding with the outlet in said first face, said passageway:
a. being unidirectional and extending in a straight line from said inlet to said outlet orifice,
b. extending at an acute angle to said first face, and
c. being smoothly tapered over a major part of its length from a larger diameter adjacent said inlet to a smaller diameter adjacent said outlet orifice, whereby powder flows smoothly from said inlet to said outlet orifice without clogging.

4,044,725

PET COLLAR

Howard I. Miller, Unit 35, Sixty-01 Apt.'s, Redmond, Wash. 98052

Filed Jan. 24, 1975, Ser. No. 543,804
Int. Cl.[2] A01K *27/00*
U.S. Cl. 119—106 **15 Claims**



1. A releasable pet collar including a plurality of interconnected, elongate, snap-locking links, each having longitudi-

nally aligned, complementary resiliently yieldable, head and socket portions, comprising:

at least one of said links being an adjustable releasing link wherein its head portion has slot means affording relative compressibility of the outer circumference of said head portion; and

adjustable screw means carried by such link and being engagable with said slot means for adjustably varying said compressibility of said outer circumference of said head portion, whereby said head portion of said link is held within a cooperating socket portion of an adjoining link by a threshold release force that may be adjusted by said screw means for each individual pet.

4,044,726

CIRCULATING WATER HEATER

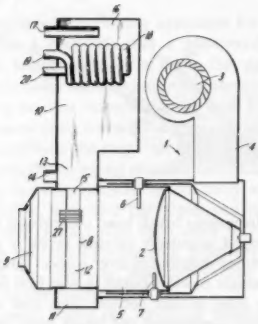
Horst Reichmann, Wuppertal, Germany, assignor to Joh. Vaillant K.G., Remscheid, Germany

Filed Dec. 23, 1975, Ser. No. 643,869

Claims priority, application Germany, Dec. 13, 1975, 7540065[U]

Int. Cl.² F22B *1/02, 7/06, 37/10*

U.S. Cl. 122—33 **5 Claims**



1. A forced circulation water heater comprising a blower burner, a horizontally extending exhaust gas duct, a heat exchanger constructed as a plate block and including upright water tubes disposed in said gas duct, a water circuit connected to said heat exchanger tubes, a storage vessel disposed above said heat exchanger and mounted directly thereon, a common support structurally connecting said storage vessel with said heat exchanger, heating system header connections and return connections extending directly into said storage vessel, said heat exchanger together with its upright water tubes being incorporated into said horizontally extending exhaust gas duct to extend over the entire cross section thereof with said tubes of said heat exchanger being connected to said storage vessel, and including plates in said heat exchanger, said plates being longer in the flow direction of said exhaust gas duct than the effective length of said heat exchanger in the same direction but smaller than the width of said support frame.

4,044,727

APPARATUS FOR HEATING A HEAT TRANSFER FLUID PROTECTED AGAINST OVERHEATING

Niklaus Rychen, Bensheim, Auerbach, and Peter Werner Fuchsnuber, Dudenhofen, Sp., both of Germany, assignors to Konus-Kessel Gesellschaft fur Warmetechnik mbH & Co. KG, Hockenheim, Germany

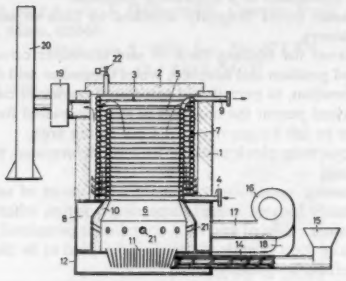
Filed July 27, 1976, Ser. No. 709,098

Claims priority, application Germany, July 30, 1975, 2534093

Int. Cl.² F22B *37/42, 27/08*

U.S. Cl. 122—449 **21 Claims**

1. Apparatus for using a solid fuel in heating a heat transfer fluid, such as a thermal oil, which is to be protected against overheating, comprising a boiler, means for effecting forced circulation of the heat transfer fluid through said boiler, said means for effecting forced circulation comprising an electrically operated pump, said boiler comprising a vertically arranged boiler casing forming a vertically extending passage, a pipe coil system located in said passage for flowing the heat transfer fluid therethrough, a furnace connected to said boiler for flowing heating gases into said passage for flow in indirect heat transfer relation with the heat transfer fluid within said pipe coil system, means for supplying solid fuel into said furnace, means for supplying combustion air into said furnace, an outlet connected to said casing for discharging heating gases after they flow over said pipe coil, and means for stopping the



heating of said pipe coil system when the forced circulation of the heat transfer fluid stops, wherein the improvement comprises that said boiler casing is open at the bottom forming an opening into the lower end of said passage, said furnace comprises a vertically extending combustion chamber having an upper end and a lower end with said upper end thereof opening into the lower end of said passage for flowing heating gases from said combustion chamber into said passage, said furnace supporting the lower end of said boiler casing, and said means for stopping the heating of said pipe coil system being connected to said means for supplying solid fuel and to said means for supplying combustion air for rendering both of said means inoperative when the forced circulation of said heat transfer fluid is stopped.

4,044,728

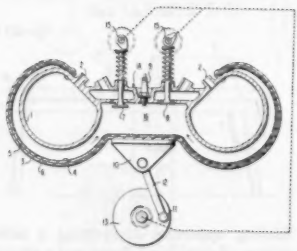
INTERNAL COMBUSTION ENGINE

Guido Moeller, Box 3647, Washington, D.C. 20007

Filed Oct. 22, 1975, Ser. No. 624,835

Int. Cl.² F02F *1/10*; F01B *19/00*

U.S. Cl. 123—18 A **16 Claims**



1. An internal combustion engine, comprising:

A. a rigid, curved wall;

B. a flexible curtain including a central base portion, sealingly attached along an edge region to said rigid wall and capable of substantially conforming to the surface contours of said rigid wall, thereby defining a combustion chamber of variable geometrical form and volume;

C. valve means, located in said rigid wall, for selective passage of gases to and from said combustion chamber; and

D. heat transfer means for cooling said rigid wall and said flexible curtain.

4,044,729
AUTOMOTIVE COOLING FAN DRIVE INCLUDING FRICTION CLUTCH

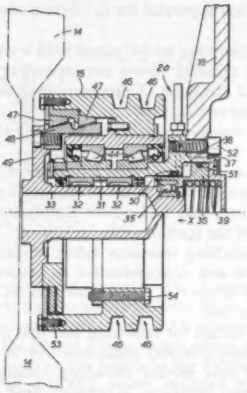
Arthur Ernest Henry Elmer, Merry Lodge, Court Orchard, Painswick, Gloucestershire, England

Filed Nov. 21, 1975, Ser. No. 634,152

Claims priority, application United Kingdom, Oct. 10, 1975, 41562/75

Int. Cl.² F01P *7/02*

U.S. Cl. 123—41.12 **9 Claims**



1. A cooling fan drive assembly comprising a static support member formed with means for attachment to a stationary mounting, an axially movable fan blade carrying element supported for rotation and axial movement relative to said support member, a rotary drive member located axially by a first thrust bearing relative to said support member, a friction clutch comprising an input clutch element connected to said drive member and an output clutch element connected to said blade carrying element, a spring acting on said blade carrying element in a direction to engage said clutch, a nonrotating fluid operated ram, a second thrust bearing interposed between said ram and said blade carrying element, and a fluid input connection to said ram, located on said static support member, said ram being arranged to oppose said spring to disengage said clutch.

4,044,730
AUXILIARY COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE

Noguchi Masaaki, Nagoya; Tanaka Yukiyasu, Okazaki; Sekiya Setsuro, and Motosugi Katsuhiko, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1975, Ser. No. 629,234

Claims priority, application Japan, Nov. 13, 1974, 49-130011

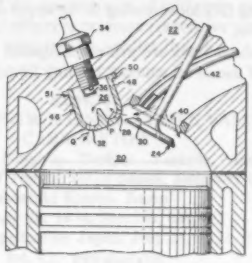
Int. Cl.² F02B *75/02*

U.S. Cl. 123—75 B **5 Claims**

1. In an internal combustion engine including a main combustion chamber, an air/fuel mixture intake to the main combustion chamber through the cylinder head, an intake valve for controlling the flow of the air/fuel mixture into the main combustion chamber, and a spark plug for igniting the air/fuel mixture, the improvement comprising:

an auxiliary combustion chamber including a cavity in the wall of the cylinder head adjacent said air/fuel mixture intake and a shell at least partially lining said cavity and forming a portion of the wall of the said main combustion chamber said shell being integrally cast within the cylinder head for enhancing heat transfer therebetween and said spark plug having its spark gap in the auxiliary combustion chamber;

at least one unvalved inlet port in said shell interconnecting the auxiliary combustion chamber and the main chamber



for conducting air/fuel mixture into the auxiliary chamber and at least one unvalved outlet port in said shell for conducting residual combustion gas from the auxiliary chamber into the main chamber;

means for retaining said shell in said cavity and means for positioning said shell in said cavity; said means for retaining said shell in said cavity including an annular channel formed in the wall of said cavity and a flange formed on the surface of said shell.

4,044,731
COMPOSITE PISTON WITH PROTECTION OF THE FASTENING SCREWS AGAINST CORROSION BY A COOLANT

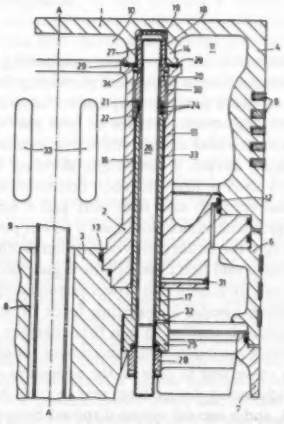
Horst Lindner, Konigsbrunn, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.), Augsburg, Germany

Filed Feb. 23, 1976, Ser. No. 660,052

Claims priority, application Germany, Mar. 8, 1975, 2510192

Int. Cl.² F01M *1/06;* **F01B** *31/08*

U.S. Cl. 123—90.35 **16 Claims**



1. In a piston for an internal combustion engine composed of a piston head and a piston body fastened together by clamping screws located within the piston and providing space between

the piston head and piston body that are filled with a cooling liquid, the improvement wherein:

each clamping screw is surrounded by a sleeve-shaped liquid-tight casing affixed in the piston head (1) and open only to the underside of the piston body said casing being a member separate from the piston head or body, extending all the way to the vicinity of the the bearing collar serving as screw head at the lower end of the clamping screw and provided at its piston head end with internal threading (27) for screwing in the upper end of the clamping screw,

whereby the screws are protected against corrosion in the event of use of an aqueous cooling liquid.

4,044,732

PNEUMATIC CONTROL SYSTEM AND PRESSURE RESPONSIVE VALVE ASSEMBLY THEREFOR

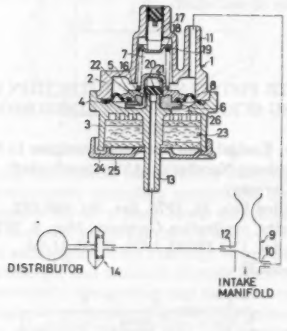
Masami Inada, Toyoake, and Kazuhiko Kitamura, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sept. 10, 1975, Ser. No. 611,960

Claims priority, application Japan, Sept. 20, 1974, 49-108971; Nov. 7, 1974, 49-128403

Int. Cl.² F02P *5/10*

U.S. Cl. 123—117 A **1 Claim**



1. A pneumatic control system comprising a carburetor having a vacuum inlet; a device for advancing the spark timing of an engine; and a pressure responsive valve assembly comprising a housing which includes an inlet port communicated with said vacuum inlet and an outlet port communicated with said advancing device, a diaphragm dividing the interior of said housing into a first chamber communicated with said vacuum inlet through said inlet port and a second chamber communicated with atmospheric air, a power piston secured to said diaphragm for unitary movement therewith, a first spring disposed within said first chamber for urging said power piston to move in one direction, said power piston being moved in the other direction against an exerting force of said first spring when a vacuum is applied to said first chamber, a valve member operatively associated with said power piston and cooperative with a valve seat to control the admission of atmospheric air to said advancing device from said second chamber via said outlet port, and a second spring disposed between said power piston and said valve member and having a smaller exerting force than said first spring, thereby urging said valve member to rest on said valve seat when said power piston is being moved in said one direction.

4,044,733

IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

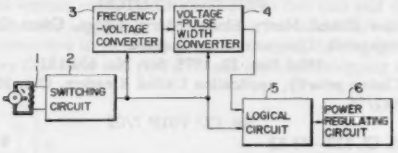
Seiji Suda, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 29, 1975, Ser. No. 572,859

Claims priority, application Japan, Apr. 30, 1974, 49-47669

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **6 Claims**



1. In an ignition apparatus for an internal combustion engine comprising:

means for generating an AC signal with a waveform having zero-level crossing points corresponding to an ignition timing and changing in predetermined time relationship with engine revolutions;

a DC power supply; an ignition coil having at least a primary winding;

an ignition coil having at least a primary winding;

a first switching transistor for producing a primary current flowing from said DC power supply into said primary winding of the ignition coil;

a second switching transistor being rendered respectively conductive and nonconductive in accordance with the waveform of the AC signal from said AC signal generating means; and

a switching circuit for rendering said first transistor respectively conductive and nonconductive in response to the output of said second switching transistor during low engine speed operation, to thereby cause primary current to flow through the primary winding of said ignition coil in accordance with a prescribed relationship between the threshold level of said second switching transistor and the waveform of said AC signal and then to interrupt the primary current for producing a high voltage at the output terminal of said ignition coil in response to said zero-level crossing points of the wave-form of said AC signal;

the improvement further comprising:

means for generating a voltage in accordance with the revolutions of said engine;

means for generating pulses the widths of which vary in accordance with the output of said voltage generating means; and

OR gate means for rendering said first transistor respectively conductive and nonconductive in response to the outputs from said second switching transistor during low engine speed operation and in response to the outputs from said pulse generating means during high engine speed operation, to thereby produce said high voltage at the output terminal of said ignition coil.

4,044,734

EXHAUST GAS RECIRCULATION VALVE MALFUNCTION INDICATOR APPARATUS

John A. Lewis, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

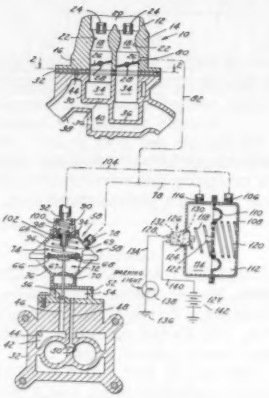
Filed May 28, 1976, Ser. No. 691,263

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **5 Claims**

1. A malfunction indicating apparatus for an engine exhaust gas recirculating (EGR) system that includes a vacuum controlled first servo connected to an (EGR) valve that is spring biased to a position blocking the flow of engine exhaust gases to the engine intake manifold and moved by vacuum above a predetermined level applied to the servo to a position permit-

ting the flow, the apparatus including a pressure balanced second servo means operably connected to the first servo and attaining a pressure unbalance condition to actuate a malfunction indicator in response to non-movement of the (EGR) valve upon application of vacuum above the predetermined level to the first servo, a source of carburetor induction passage throttle valve controlled vacuum, the pressure balancing servo means including a hollow housing divided into first and second chambers by a piston, means connecting the source of vacuum to the first servo and to the first chamber, second



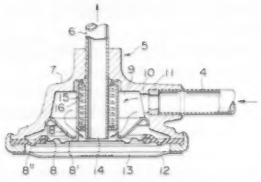
means connecting the first servo to the second chamber whereby flow of vacuum to the first servo flows vacuum to both first and second chambers to provide a pressure balanced neutral position of the piston, spring means acting on opposite sides of the piston to urge the piston to the balanced neutral position, malfunction indicator means engaged by and rendered operative in response to movement of the piston in one direction to a predetermined position, and control means in the second means normally blocking vacuum to the second chamber to thereby effect movement of the piston by the vacuum in the first chamber to engage the malfunction indicator means.

4,044,735

EXHAUST GAS RECIRCULATION VALVE

Masaharu Sumiyoshi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 20, 1976, Ser. No. 659,954
Claims priority, application Japan, Oct. 22, 1975, 50-127106
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **4 Claims**



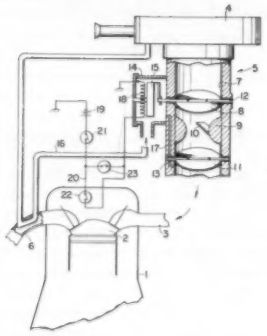
1. An exhaust gas recirculation valve comprising a housing which contains a back pressure control chamber provided with a gas inlet port connected with an exhaust pipe of an internal combustion engine via a throttling means, a membrane means including a central metal sheet member and an annular peripheral rubber sheet member, said membrane means forming a part of the wall defining said back pressure control chamber, the outer surface of said membrane which faces opposite to the inside of said chamber being exposed to atmospheric pressure, a gas outlet tube supported by said housing and having an open end positioned to closely oppose a central portion of the inside surface of said membrane means which faces the inside of said chamber, the opening of said open end of said gas outlet tube being controlled by said membrane means, a funnel means adapted to guide gases from said gas inlet port towards said central portion of said membrane means, an annular spring retainer supported on said central portion of said membrane means, and a coil spring located around said gas outlet tube and supported between said spring retainer and said housing, wherein the ratio of the opening area of said open end of said gas outlet tube to an effective pressure responsive area of said membrane means is substantially smaller than 1.

4,044,736

DEVICE FOR CONTROLLING A CHOKE VALVE IN A CARBURETOR

Hidenori Tateno, Nagoya; Toshiro Yoshida, and Koichi Hirasawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed July 18, 1974, Ser. No. 489,492
Claims priority, application Japan, July 18, 1973, 48-80248
Int. Cl.[2] F02D *11/08*
U.S. Cl. 123—119 F **4 Claims**



1. In an internal combustion engine, an automatic choke unit including an air cleaner, a carburetor arranged to be connected to said air cleaner, a venturi located in said carburetor, a choke valve positioned within said carburetor between said venturi and the connection of said carburetor to said air cleaner for controlling the flow of air to said venturi, a casing located exteriorly of and mounted on said carburetor, a bimetal member positioned within said casing and connected to said choke valve so that said bimetal member controls the opening and closing of said choke valve as the temperature level within the casing rises and falls, a flow passageway for introducing a flow of air into said casing, said flow passageway arranged to be heated by the internal combustion engine so that as the engine warms-up said flow passageway delivers heated air into said casing, means connected to the interior of said casing for drawing air through said flow passageway into said casing, a heater unit positioned within said casing and arranged to supply heat to said bimetal member, means for generating heat within said heater unit including a first actuating means for commencing the operation of said heater unit only after the internal combustion engine has reached a predetermined warm-up level, wherein the improvement comprises that said means for generating heat includes second actuating means for commencing the operation of said heater unit when the ambient atmospheric pressure surrounding the exterior of the internal combustion engine drops below a predetermined level, said second actuating means located adjacent to and exteriorly of said engine and being separate from and spaced from both said carburetor and said casing containing said bimetal member for directly sensing the ambient atmospheric pressure outside the engine so that the ambient atmospheric pressure is the sole control of said second

actuating means which controls the operation of said heater unit, and said flow passageway having an inlet end connected to said air cleaner for flowing a part of the intake air from said air cleaner through said flow passageway for introduction into said casing.

4,044,737

EXHAUST GAS CONTROL VALVE

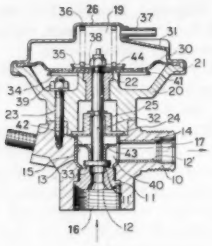
Satomu Nishimura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 17, 1976, Ser. No. 687,088

Claims priority, application Japan, Nov. 10, 1975, 50-151727[U]

Int. Cl.² F02M *25/06*; F16K *51/00*

U.S. Cl. 123—119 A **5 Claims**



1. An improved internal combustion engine exhaust gas control valve of the type in which a valve-closure member for controlling the flow of exhaust gas into the gas chamber located between an inlet port and outlet port is mechanically connected to a diaphragm by a valve stem, said diaphragm forming one wall of a vacuum chamber in fluid flow communication with an engine vacuum source and being biased to a position where said valve closure member closes said inlet port and in which an increase in engine vacuum causes said diaphragm to move against said bias for opening said inlet port, the improvement comprising a corrosion-resistant metal liner covering the inside walls of said exhaust gas chamber, inlet port, and outlet port that are exposed to said exhaust gas and also including a fluted flange mounted on and around said valve stem proximate said valve-closure member, the periphery of said flange flaring out from said valve stem and towards the walls of said gas chamber for protecting said stem from exposure to said gas and for forming a curved wall of said gas chamber when said valve-closure member is moved to open said inlet port, the exposed surfaces of said flange also being covered with a corrosion-resistant metal liner, said fluted flange providing rounded corners in said gas chamber for reducing locations at which condensate in said exhaust gas may accumulate.

4,044,738

POLLUTION CONTROL ARRANGEMENTS FOR ENGINES

Malcolm Williams, Solihull, and Christopher Robin Jones, Alcester, both of England, assignors to Lucas Electrical Company Limited, Birmingham, England

Filed June 5, 1975, Ser. No. 584,167

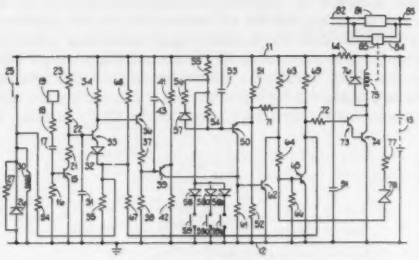
Claims priority, application United Kingdom, June 7, 1974, 25304/74

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **6 Claims**

1. A pollution control arrangement for an engine including a valve by way of which exhaust gases can be recirculated, a solenoid which when energized closes said valve, and electronic control means energizing said solenoid when the engine speed is above a predetermined level, said control means comprising:

an engine speed transducer for producing an a.c. signal of frequency proportional to the engine speed; and



means sensitive to said frequency of said a.c. signal for continuously energizing said solenoid when the frequency of said signal is above a predetermined level.

4,044,739

EXHAUST GAS CONTROL VALVE

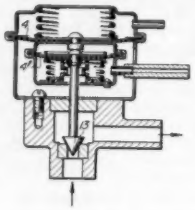
Motohisa Miura, Kariya; Yukihiko Muramatsu, Hekinan, and Noboru Matsumoto, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyta, both of, Japan

Filed Aug. 6, 1975, Ser. No. 602,313

Claims priority, application Japan, Aug. 8, 1974, 49-95351[U]

Int. Cl.² F02M *25/00*

U.S. Cl. 123—119 A **8 Claims**



1. An exhaust gas control valve for an internal combustion engine comprising;

an upper and a lower outer casings;

a diaphragm interposed between said upper and lower outer casings for forming respectively upper and a lower compartments, said lower compartment being communicated wth the atmosphere;

an upper inner casing disposed in said upper compartment and fixed to said diaphragm;

a first spring disposed in said upper compartment for biasing said diaphragm toward said lower compartment;

said upper outer casing, said upper inner casing and said diaphragm forming a first sealed negative pressure chamber to be interconnected with a carbureter for being applied with the negative pressure in said carbureter;

a lower inner casing disposed in said lower compartment and fixed to said diaphragm;

a bellows fixed to said diaphragm and said lower inner casing;

said bellows, said diaphragm and said lower inner casing forming a second sealed negative pressure chamber to be interconnected with an intake manifold of an engine for being applied with the negative pressure in said intake manifold;

a second spring disposed in said second sealed negative

pressure chamber for biasing said diaphragm toward said upper compartment;

a valve seat disposed in a conduit communicating an exhaust pipe of said engine with an intake pipe of said engine;

a rod fixed at one end thereof to the inner portion of said diaphragm surrounded by said lower inner casing, said rod being provided at the other end thereof with a valve head for abutting on said valve seat, whereby the amount of the exhaust gases flowing through said conduit is controlled by the displacement of said rod driven by said diaphragm.

4,044,740

BURNER ASSEMBLY FOR AN INLET MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

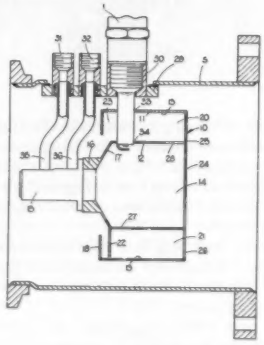
Alan Joseph Gerrard, Blackburn, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 4, 1975, Ser. No. 628,554

Claims priority, application United Kingdom, Nov. 6, 1974, 47951/74

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 G **4 Claims**



1. An internal combustion engine having an air inlet manifold in combination with a burner assembly for heating air in said air inlet manifold, said burner assembly comprising (i) a hollow body mounted in said inlet manifold, said hollow body including a first annular casing and a second annular casing spaced inwardly of said first annular casing so as to define an air passage between said casings, (ii) a plurality of inlets at one end of said body, (iii) a plurality of outlets at an opposite end of said body, (iv) baffle means dividing said air passage into a first series of compartments alternating with a second series of compartments, each compartment of said first series being connected with one of said inlets, and each compartment of said second series being connected with one of said outlets, (v) an aperture through said annular casing serving to connect each said compartment with an interior of said second annular casing, which interior defines a combustion zone of said burner assembly, and (vi) a fuel sprayer arranged to discharge fuel into said combustion zone, the arrangement being such that air passing through said inlets is constrained to flow into said combustion zone before reaching said outlets, said outlets being arranged to communicate directly with said combustion zone.

4,044,741

FUEL VAPOR GENERATOR

Wayne Swingley, Rte. 6, Box 138, Spokane, Wash. 99207

Filed Aug. 27, 1975, Ser. No. 608,040

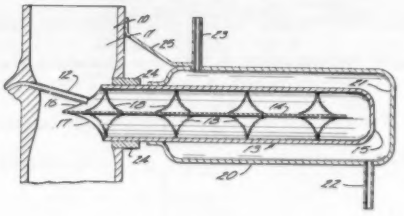
Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 AB **11 Claims**

1. A fuel vapor generator for an internal combustion engine including a carburetor that has a main nozzle with an outlet through which fuel is normally discharged into a venturi through which the fuel-air mixture is drawn into an intake manifold, the fuel vapor generator comprising:

a hollow tubular member having interior walls which form a continuous passageway double back upon itself in an elongated configuration, the passageway terminating at open inlet and outlet ends located adjacent to one another;

thermal insulating means surrounding the member at locations adjacent the inlet and outlet ends of the passageway



adapted to fix the member to the exterior of a carburetor with the inlet end projecting into a portion of the venturi in receptive communication with the outlet of the main nozzle and with the outlet end projecting into the venturi downstream from the location of the inlet end to thereby direct the fuel and a portion of the air entering the carburetor through the passageway;

means for heating the hollow tubular member to a temperature above the boiling point of the fuel.

4,044,742

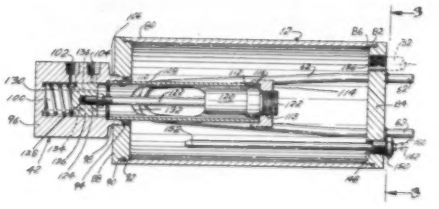
METHOD AND APPARATUS FOR PROCESSING FUEL INTO AN INTERNAL COMBUSTION ENGINE

Henry C. Linder, 131 Biz Point Road, Anacortes, Wash. 98221

Filed Aug. 18, 1975, Ser. No. 605,665

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 E **15 Claims**



1. A fuel expander comprising:

a. a housing for housing a liquid;

b. a cold water inlet connecting with said housing:

c. a hot water inlet connecting with said housing;

d. a heat sensitive means inside said housing;

e. a valve means functioning with said cold water inlet, and with said hot water inlet for controlling the flow of cold water and for controlling the flow of hot water into said housing to achieve a heating water of a desired temperature and also connecting with said heat sensitive means;

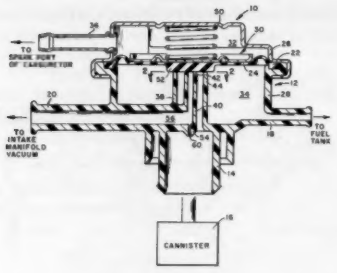
f. A fuel line positioned in said housing for flowing fuel through said housing and to heat said fuel to a temperature approximately that of said heating water of a desired temperature; and,

g. said heat sensitive means in reacting to the temperature in the housing moving said valve means to regulate the flow of hot water through said hot water inlet and to regulate the flow of cold water through said cold water inlet.

4,044,743
CANNISTER PURGE VALVE ASSEMBLY

Bryan Eaton, Chatham, Canada, assignor to Fram Corporation, Providence, R.I.

Filed Mar. 19, 1976, Ser. No. 668,368
Int. Cl.[2] F02M *37/00*
U.S. Cl. 123—136 **9 Claims**

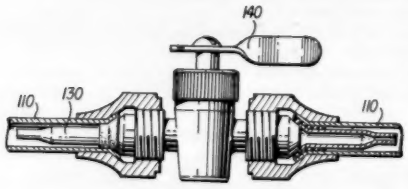


1. In a vehicle emissions control system including a cannister containing material for absorbing vapors from the vehicle fuel tank, a purge valve for purging said cannister during normal operation of the vehicle, said purge valve including a housing defining a chamber therewithin, first inlet means communicating said chamber with the cannister, second inlet means communicating said chamber with said fuel tank, outlet means through which the cannister is purged, said first inlet means and said outlet means terminating in inner and outer rings defining valve seating areas on each of said rings, valve means adapted to engage said valve seating areas, and yieldable means urging said valve means into sealing engagement with said valve seating areas to thereby prevent communication between said first and second inlet means to said outlet means until the valve means move away from the seating areas.

4,044,744
INTERNAL COMBUSTION ENGINE FUEL ECONOMIZER SYSTEM

James J. Keefer, 5205 Hillburn Ave., Baltimore, Md. 21206

Filed July 9, 1976, Ser. No. 703,772
Int. Cl.[2] F02M *17/14*
U.S. Cl. 123—136 **2 Claims**



1. In combination with an internal combustion engine, fuel feed economizer apparatus, adapted to a gas line leading from a fuel tank to the carburetor comprising:

A. a fuel line joining tank to carburetor;

B. plural injectors sealed within the fuel line, between the tank and the carburetor, each said injector having a fluted orifice end of expanded circular cross-section and a restricted orifice end of substantially elongate cross-section;

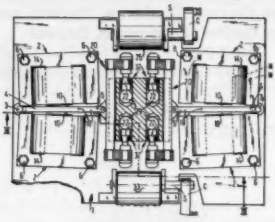
C. plural control valves interposed between the said tank and carburetor, there being one each injector disposed with the fluted end of each said injector adjacent the respective input and output ends of the valves; and

D. at least one union disposed between the valves, said union having injectors with the fluted end of each said injector adjacent input and output ends of the union.

4,044,745
INJECTOR PUMP

Willem Brinkman, Velp, and Bernard Breunkink, Enschede, both of Netherlands, assignors to Holec, N.V., Hengelo, Netherlands

Continuation of Ser. No. 416,852, Nov. 19, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 665,113
Claims priority, application Netherlands, Mar. 14, 1973, 7303579
Int. Cl.[2] F02M *32/00*
U.S. Cl. 123—139 E **39 Claims**



1. The method of forming a combustible fuel/air mixture for an internal combustion engine, which comprises the steps of:

a. providing an armature which is pivoted at one end so as to present a free end which may swing freely back and forth and which free end has at least one fuel displacing member connected thereto;

b. intermittently pumping fuel into admixture with air to form fuel/air mixture by swinging said free end of the armature back and forth in response only to electro-magnet motivating forces;

c. effecting said motivating forces for intermittent time durations to act alternately in opposite directions by subjecting a region of said armature lying between its ends to electro-magnetic attraction first on one side of the armature and then on the other side of the armature and so on so that fuel is discharged at a rate which increases strongly during each discharge period;

d. intercepting the motion of said armature and the fuel-displacing member connected to it during each of said time durations positively to terminate motion of said member substantially at the instant of each interception whereby to control the volume of fuel pumped during each intermittent fuel discharge period;

e. controlling the frequency of occurrence of said motivating forces according to engine speed; and

f. controlling the volume of fuel pumped per intermittent discharge period by changing the timing of motion termination whereby to alter the extent of movement of said displacing member in a direction of movement of said displacing member.

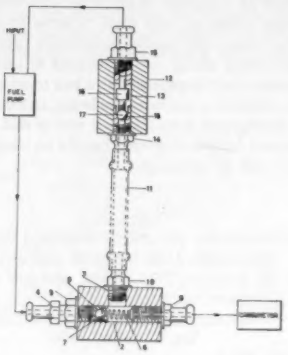
4,044,746
FUEL CONTROL DEVICE

Ronald Swynerton Kaye, Mt. Eliza, Australia, assignor to Marie Kaye, Mt. Eliza, Australia, a part interest

Filed Feb. 27, 1975, Ser. No. 553,827
Claims priority, application Australia, Dec. 24, 1974, 0135/74
Int. Cl.[2] F02M *5/10*; G05D *9/00*
U.S. Cl. 123—139 AV **6 Claims**

1. A fuel regulating device for motor vehicles having a fuel pump, a carburetor and a connecting fuel line, comprising a block having a bore formed therein to provide a first unitary housing, one end of said bore being adapted to be connected to the fuel pump outlet line, the opposite end of said bore being

adapted to be connected to the fuel inlet line to the carburetor, pressure responsive means mounted in said bore to prevent fuel flow to the carburetor below a minimum pressure, a second bore formed in said block extending transversely to said first bore and communicating therewith; a second block of the same configuration as said first block and having a bore formed therein providing a second unitary housing, conduit means connecting said second bore to one end of the bore in said second block, the opposite end of the bore in said second block



being adapted to be connected to the inlet of said fuel pump, and pressure responsive means in the bore of said second block adapted to allow the flow of fuel to the inlet of the fuel pump at a pressure greater than said minimum fuel pressure of said pressure responsive means in said first housing; the second bore in the first housing communicating with and being connected to one end of said conduit means in an orientation of the first housing at a lower level than said opposite end of the bore in the first housing, to thereby prevent any air entrained in the fuel from passing to the fuel pump.

4,044,747

SPARK IGNITION ENGINE

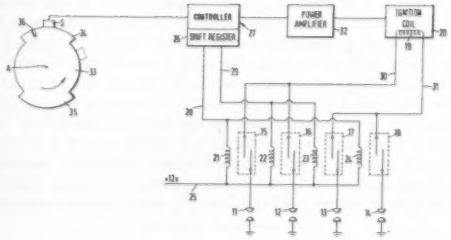
Kenneth Longstaff, Alcester, England, assignor to British Leyland UK Limited, London, England

Filed Jan. 26, 1976, Ser. No. 652,043

Claims priority, application United Kingdom, Feb. 4, 1975, 4641/75

Int. Cl.² F02P *3/02*

U.S. Cl. 123—148 E **4 Claims**



1. A spark ignition engine, having a crankshaft to which is coupled a plurality of reciprocatable pistons, incorporating an ignition system comprising:

a. a crankshaft pulse generator adapted to generate output pulses in dependence on crankshaft speed;

b. an ignition coil having a high voltage secondary winding;

c. a first group of at least two reed relays and a second group of at least two reed relays; each relay of the first group connecting one end of the secondary winding to a different spark plug, each relay of the second group connecting the other end of the secondary winding to a different spark plug; and

d. a shift register adapted, in response to a pulse from the crankshaft pulse generator to close one reed relay in each group prior to generation of a voltage in the winding so that at least two spark plugs fire upon generation of a voltage in the winding; the register also being adapted to cause the opening of the reed relay in each group when the voltage has been dissipated.

4,044,748

CONTINUOUS CUTTING MACHINE FOR STONE AND BUILDING MATERIALS

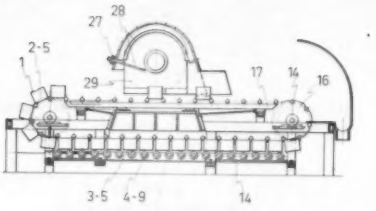
Eliseo Herrando Villanueva, Ctra. de Barcelona Km. 9, Museros Valencia, Spain

Filed Dec. 8, 1975, Ser. No. 638,787

Claims priority, application Spain, Feb. 5, 1975, 209676

Int. Cl.² B28D *1/04*

U.S. Cl. 125—13 R **1 Claim**



1. A cutting machine for petrous and building materials, comprising:

first endless conveyor belt means made up of a plurality of plates which extend transversely of the direction of travel of the conveyor belt means and are journalled together, each plate having a central projection extending in the direction of travel, said central projections together forming a longitudinal partition which acts to divide the upper strand of the conveyor belt means into two zones;

a cutting member positioned above the upper strand of the first endless conveyor belt means for cutting petrous or building material being transported on said upper strand;

second endless conveyor belt means aligned with the first endless conveyor belt means at the discharge end thereof, to receive and convey cut petrous or building material that has been conveyed by the first endless conveyor belt means to the discharge end thereof; and third endless conveyor belt means aligned with the second endless conveyor belt means at the discharge end thereof, to receive and convey cut petrous or building material that has been conveyed by the second endless conveyor belt means to the discharge end thereof, said third endless conveyor belt means comprising at least two parallel endless belts having a space therebetween for permitting waste material to fall from the third endless conveyor belt means.

4,044,749

CONCRETE REMOVAL TOOL

Burlie R. Bowen; Claud C. Barrington; Thomas J. Ames, and Glen E. Lochte, all of Houston, Tex., assignors to HydroTech International, Inc., Houston, Tex.

Filed Apr. 30, 1976, Ser. No. 682,039

Int. Cl.² B28D *1/32*

U.S. Cl. 125—23 R **19 Claims**

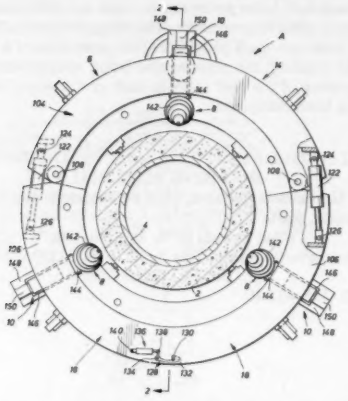
1. Apparatus for breaking concrete from a concrete coated pipe comprising:

a frame mountable on said pipe;

bit means rotatably supported by said frame for disengageably engaging said concrete to break said concrete from said pipe,

means for moving said bit means relative to said pipe;

and means for simultaneously driving said bit means against said concrete to impart massive force thereto exceeding



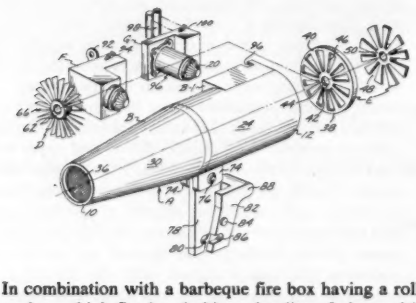
the strength of said concrete to thereby break said concrete from said pipe as aforesaid.

4,044,750

BARBEQUE BLOWER

Kenneth H. Zeigler, 23851 Larkwood St., El Toro, Calif. 92630

Filed Mar. 26, 1976, Ser. No. 670,984
Int. Cl.[2] F01D *17/00*; F04D *29/56*
U.S. Cl. 126—25 B **3 Claims**



1. In combination with a barbeque fire box having a rolled upper edge, which fire box holds a plurality of charcoal briquettes in side-by-side relationship, a power-driven blower unit that may be oriented in a desired direction relative to said fire box to generate a stream of air that sweeps across said briquettes to serve as a draft to assist in the initial ignition of said briquettes and to maintain said briquettes in a glowing heat emitting condition after said ignition, said power-driven blower unit including:

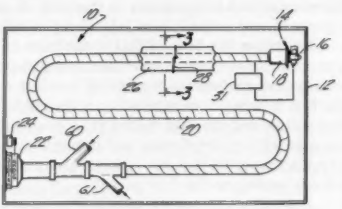
a. an elongate housing that has first and second open ends;
b. a transverse spider in said housing intermediate said first and second ends;
c. an air intake member transversely disposed in said second end, said intake member having a number of circumferentially spaced air openings therein;
d. a transverse bladed fan disposed in said housing intermediate said spider and said second end;
e. a plate that defines a number of circumferentially spaced, radially extending spokes, said plate adjacently disposed to said air intake member, and said plate when rotated controlling the effective area of said openings in said air intake member;
f. a prime mover mounted on said housing adjacent said second end, said prime mover including a drive shaft that extends into said housing;
g. first and second meshing bevel gears, said first gear secured to said drive shaft and said second gear secured to said bladed fan;
h. a longitudinal shaft rotatably supported by said spider and said air intake member and rigidly secured to said plate, said shaft rotatably supporting said bladed fan;
i. a handle secured to said shaft adjacent said plate and outwardly disposed therefrom, said shaft serving the dual function of rotatably supporting said bladed fan, said rotatably adjusting said plate relative to said air intake member when said handle is manually rotated; and
j. spring loaded clamp means secured to said housing that may removably engage said fire box to support said housing at a desired position on the latter, and the rate at which air is discharged from said first end of said housing being controlled by rotating said handle to vary the effective area of said air openings.

4,044,751

RADIANT ENERGY HEATING SYSTEM WITH POWER EXHAUST AND EXCESS AIR INLET

Arthur C. W. Johnson, Troy, Mich., assignor to Combustion Research Corporation, Pontiac, Mich.

Filed May 19, 1975, Ser. No. 578,764
Int. Cl.[2] F24C *3/06*
U.S. Cl. 126—91 A **13 Claims**



1. A radiant energy heating system comprising: a burner for producing heat through the combustion of a fuel/air mixture, said burner comprising a housing defining a large combustion chamber and a fuel nozzle adjacent one end thereof; an elongated radiant energy heater tube of a diameter substantially smaller than the diameter of the combustion chamber having an input end and an exhaust end and extruding through the area to be heated; the input end being connected to the other end of the combustion chamber housing for receiving the products of combustion; power exhaust means at said exhaust end for continuously drawing air through the tube from the burner during operation of the burner and discharging said products and air beyond the area to be heated thereby to produce a negative pressure within the heater tube; and excess air inlet means for admitting excess ambient air to said input end at a point downstream of the fuel/air combustion area under the forced draft of said power exhaust means to cool the heated primary air at said inlet end below the rated capability of said burner to limit tube temperatures so as to maintain strength of materials of construction and minimize oxidation.

4,044,752

SOLAR COLLECTOR WITH ALTITUDE TRACKING

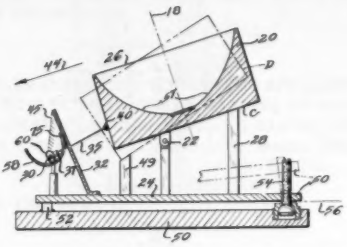
Amitzur Z. Barak, Chicago, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 1, 1975, Ser. No. 601,112
The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **10 Claims**

1. A device for turning a solar energy collector about an

east-west axis between at least two positions so that the frontal face of the collector is directed approximately towards the sun as the altitude of the sun varies, comprising,

axle means upon which the collector is mounted free to rotate thereabout with the frontal face directed skyward, said axle means being aligned so that rotation of the collector thereabout is in a north-south direction, a frame, a first heat responsive element which with solar radiation incident thereupon assumes a first stable state, and fixed shadow means for shading said first element from the sun's radiant energy with the sun within a first range of altitudes of the sun and for allowing the sun's radiant energy to be incident upon said first element within a second range of altitudes of the sun, said first element being responsive to



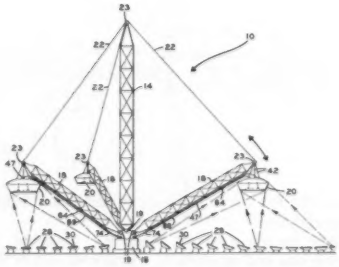
being shaded by said shadow means to assume a second stable state, said first element being so coupled to the collector and said frame that in response to said first element being in said first state due to being radiated by said sun within said second range, the collector is rotated about said axle means to assume a first position whereby the collector's frontal face is approximately directed towards said second range of altitudes of the sun, and that in response to said first element being in said second state due to being shaded by said shadow means with the sun within said first range the collector is rotated about said axle means to assume a second position whereby the collector's frontal face is approximately directed towards said first range of altitudes of the sun.

4,044,753

SOLAR ENERGY COLLECTION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of M. Kudret Selcuk, La Canada, Calif.

Filed Apr. 28, 1976, Ser. No. 681,096
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **8 Claims**



1. An energy collection system particularly suited for use in collecting energy from a solar source including:

A. at least one heliostat having a reflecting surface for reflecting an incident beam of radiant solar energy; and

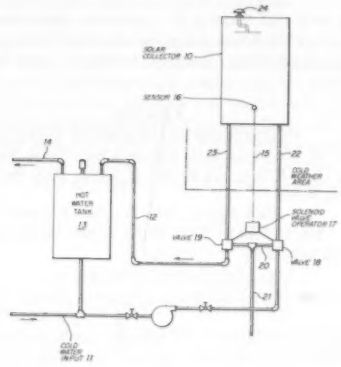
B. an energy receiver for absorbing heat from an incident beam of radiant solar energy reflected by said surface including means for converting solar energy to heat, comprising a plurality of concentrically related annular conduits and a plurality of substantially linear conduits interconnecting said annular conduits forming a network of a substantially aspherical configuration for conducting a working fluid in its liquid phase along a tortuous path.

4,044,754

SOLAR COLLECTOR AUTOMATIC FREEZE PROTECTION SYSTEM

Paul W. Cronin, Andover; Peter H. Ottmar, Attleboro, both of Mass.; Ernest F. Root, Nashua, N.H., and Harry M. Simmons, Reading, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed May 10, 1976, Ser. No. 684,519
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A freeze protection system for solar collectors comprising:

a. solar collector means for holding a fluid to be heated;

b. input means for supplying fluid to said collector means;

c. output means for removing fluid from said collector means;

d. sensor means for automatically monitoring the temperature of said collector means;

e. valve means coupled to said output means for automatically removing fluid from said collector means when the temperature of said collector means drops to a first predetermined level to prevent fluid from freezing up within said collector means; and

f. switch means coupling said sensor means to said valve means and actuated by said sensor means, said switch means being normally closed when said collector means is filled with fluid and which automatically opens when the temperature in said collector means drops to said first predetermined level for actuating said valve means for automatically removing fluid from said collector means.

4,044,755

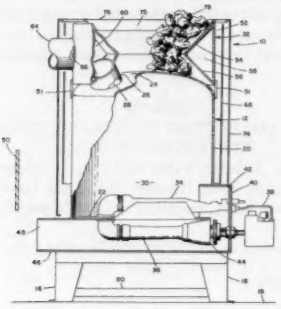
ROCK HEATER FOR SAUNA

Toivo I. Kolkka, 1175 Shasta, Redwood City, Calif. 94063

Filed June 10, 1975, Ser. No. 585,613
Int. Cl.[2] F24H *1/34*
U.S. Cl. 126—344 **12 Claims**

1. In a rock heater: a housing of heat-conductive material, said housing being provided with a top and having a chamber below the top in which combustion gases can be generated, said top having an upper extremity and sloping downwardly and outwardly from said upper extremity in substantially all directions; means having a fluid passage therethrough and

disposed adjacent to the top for retaining a pile of rocks thereon; and a pipe placing said fluid passage in fluid communi-



cation with said housing for permitting combustion gases to flow out of the housing and into the fluid passage, the latter having a fluid outlet for the exhausting of gases therefrom.

4,044,756

PHOSPHENE GENERATOR DEVICE

Robert W. Hamilton, 5109 Williams Fork Trail; No. 207, Boulder, Colo. 80301, and Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003

Filed Apr. 2, 1976, Ser. No. 673,145
Int. Cl.[2] A61B *5/00*; G02B *11/04*; G03B *35/02*
U.S. Cl. 128—2 N **11 Claims**

1. In a phosphene generator device adapted to be worn on the head of a person wherein openings are provided therein in spaced relation to one another so as to be aligned with the eyes whereby to pass light from an external light source to the eyes, the improvement comprising:

a movable element mounted on said device so as to traverse the eye openings, said movable element having blade members passing over the eye openings of a size so as not to completely block the passage of light through the eye openings, and

variable speed drive means to impart movement to said movable element at a predetermined but variable rate of speed in order to produce light pulses in the range of 1 to 25 cycles per second.

4,044,757

CHOLANGIOGRAPHY DEVICE AND METHOD

Daniel M. McWhorter, Arlington Heights, and Bhupendra C. Patel, Elgin, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Jan. 14, 1976, Ser. No. 648,990
Int. Cl.[2] A61B *6/00*; A61M *1/00*
U.S. Cl. 128—2 A **3 Claims**

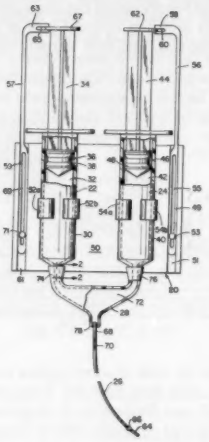
1. A device for use in cholangiography and similar procedures, comprising:

a first syringe having a barrel defining a chamber for retaining an irrigation liquid, and a plunger having one end received in said chamber for pumping the liquid from said chamber;

a second syringe having a barrel defining a chamber for retaining a liquid contrast medium, and a plunger having one end received in the chamber of the second syringe for pumping the contrast medium from said chamber;

a catheter having a distal end, a proximal end, and a lumen extending through the catheter;

means for connecting the proximal end of said catheter to the chambers of the first and second syringes without



exposing the liquids to the atmosphere intermediate the lumen and chambers, whereby the irrigation liquid and contrast medium may be ejected through the catheter without introduction of air into the device; and

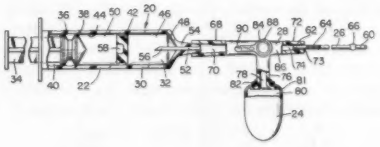
a plate, said syringes being secured to said plate, a pair of elongated arms each having one end secured to said plungers and the other ends being slotted and slidably secured to said plate, screws secured to said plate and positioned in said slots to releasably lock said arms to in turn lock said plungers at any inner or outer selected position.

4,044,758

CHOLANGIOGRAPHY DEVICE AND METHOD

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jan. 14, 1976, Ser. No. 649,112
Int. Cl.[2] A61B *6/00*
U.S. Cl. 128—2 A **22 Claims**



1. A device for use in cholangiography and similar procedures, comprising:

a syringe having a barrel defining a chamber, a plunger having one end received in a proximal end of the syringe chamber for pumping liquid from the chamber, a floating barrier received in the chamber and defining a first compartment intermediate the barrier and a distal end of the chamber for retaining an irrigation liquid and a second compartment intermediate the barrier and said one end of the plunger for retaining a liquid contrast medium;

a catheter having a distal end, a proximal end, and a lumen extending through the catheter;

a liquid receiving receptacle having a chamber;

means for selectively connecting the syringe to the catheter lumen and the receptacle chamber; and

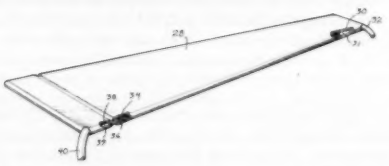
means for establishing communication between the connecting means and said second compartment when said barrier is located adjacent the distal end of the chamber, whereby an initial portion of the irrigation liquid may be pumped through the catheter, a remaining portion of the irrigation liquid may be pumped into the receptacle chamber until the barrier is located adjacent the distal end of the syringe chamber to establish communication with the second compartment, and the liquid contrast medium may be pumped through the catheter lumen without introducing air into the device.

4,044,759

AUTO-TRANSFUSION TORNIQUET APPLIANCE AND METHOD OF UTILIZING THE SAME TO CONTROL FLOW OF BLOOD THROUGH A BLOOD VESSEL

Bahman Ghayouran, 860 Harrison Ave., Boston, Mass. 02111

Filed Feb. 11, 1976, Ser. No. 657,212
Int. Cl.² A61H *1/00*
U.S. Cl. 128—24 R **4 Claims**



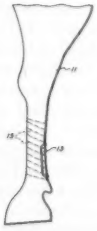
1. An improved tourniquet apparatus for controlling flow of blood in a patient's body, said apparatus including a flexible, substantially non-stretchable wrapper member engageable around a limb of the patient's body and inflatable means for selectively exerting pressure along the limb to displace blood therefrom, said inflatable means consisting in a bladder supported inside the wrapper member and having intermediate portions yieldably secured together by Velcro surfaces.

4,044,760

TENDON SHIELD AND METHOD OF MAKING THE SAME

Armand Pontarella, 36 Lansing Circle North, Rochester, N.Y. 14624

Filed Mar. 15, 1976, Ser. No. 666,631
Int. Cl.² A61F *13/00*
U.S. Cl. 128—82 **3 Claims**



1. A bowed tendon shield assembly for protecting an affected part of a horse's leg having a bowed tendon, said assembly comprising a shield member constituting a single integral light-weight piece of moldable rigid material and of curved cross-section having a concave surface shaped to engage exactly and precisely against the area of the bowed tendon and a substantial marginal area immediately around the bowed tendon of a particular individual horse, and means for securing said shield member to the leg of the horse, said securing means comprising a bandage-like wrapping adapted to extend a multiplicity of turns around said leg outside said shield member for holding said shield member tightly engaged throughout substantially its entire concave surface with said affected part of said leg and for exerting pressure against said tendon through said shield member, the entire assembly being of sufficiently light weight so that it may be worn on the horse during a race without interfering appreciably with the speed of running.

4,044,761

ORTHOPEDIC BANDAGE

John Ives Hall, Welwyn Garden City, England, assignor to Smith & Nephew Research Limited, England

Filed Feb. 19, 1976, Ser. No. 659,261
Int. Cl.² A61F *5/04*
U.S. Cl. 128—90 **12 Claims**

1. An orthopedic bandage which comprises:

a carrier, and

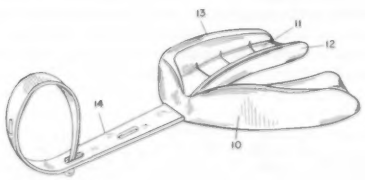
a water-hardenable powder material loaded on said carrier, said water-hardenable powder material comprised of a mixture of particles of (a) a water-soluble cross-linkable polymeric material containing carboxylic acid groups, and (b) at least one material selected from the group consisting of zinc oxide and zinc salts with at least one weak acid, said at least one material having been at least partially coated with an organic acid to reduce its surface reactivity.

4,044,762

ATHLETIC MOUTHGUARD

Alfred G. Jacobs, c/o Safe-T-Gard, Inc., P.O. Box 934, Madison, Wis. 53701

Continuation of Ser. No. 331,794, Feb. 12, 1973, abandoned.
This application Aug. 23, 1976, Ser. No. 716,375
Int. Cl.² A61M *7/00*
U.S. Cl. 128—136 **1 Claim**



1. A generally U-shaped athletic mouthguard molded from a composition of liquid impermeable ethylene vinyl acetate copolymer and not more than 5% by weight fluoride compound selected from the group consisting essentially of sodium fluoride, stannous fluoride, and sodium fluorosilicate; said liquid impermeable ethylene vinyl acetate copolymer having a melting point below the fluoride compound whereby when heated to a temperature in excess of normal human body temperature can be molded to receive an impression of the wearer's teeth and when cooled to the normal human body temperature is resilient and shape retaining.

4,044,763

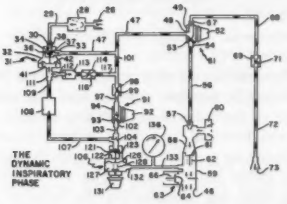
VENTILATOR AND METHOD

Forrest M. Bird, 212 NW. Cerritos, Palm Springs, Calif. 92262

Filed July 7, 1975, Ser. No. 593,667
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **8 Claims**

1. In a ventilator having an inhalation phase and an exhalation phase in its operative cycle for use with a source of gas under pressure, a master sequencing cartridge having an inlet

adapted to be connected to the source of gas under pressure and an outlet, a valve member movable between open and closed positions for controlling the flow of gas from the inlet to the outlet, diaphragm means for moving said valve member from an open position to a closed position and forming first and second chambers in the cartridge on opposite sides of the diaphragm means, a breathing circuit outlet, breathing circuit means coupling the breathing circuit outlet to the outlet of the master sequencing cartridge, a single volume/rate control valve assembly having an inlet and an outlet with an orifice interconnecting the same and an adjustable needle valve disposed in the orifice, means coupling the inlet of the control valve assembly to the outlet of the master sequencing cartridge, means connecting the outlet of the control valve assembly to the first chamber on one side of the diaphragm means to bleed gas through the control valve assembly in one direction into said first chamber to move said valve member to terminate



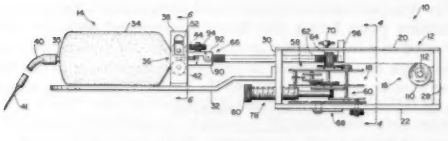
the inspiratory phase and initiate the expiratory phase and thereafter to bleed off gas from the first chamber through the control valve assembly in an opposite direction into the breathing circuit means whereby after sufficient bleed-off of gas from the first chamber the valve member moves to the open position to terminate the expiratory phase and initiate the inspiratory phase, and volume/rate control valve assembly including a single adjustable control means for the ventilator to control both the length of the inspiratory phase and the length of the expiratory phase such that an almost constant inspiratory expiratory time ratio from operative cyclic frequencies from over approximately 30 per minute down to approximately 5 per minute is maintained and a volume of gas to the patient which is substantially inverse to the rate is provided whereby, at high frequencies, there is a small tidal volume and at low frequencies there is a large tidal volume which meet the requirements for an infant and an adult, respectively.

4,044,764

FLUID INFUSION APPARATUS

Anthony W. Szabo, 37 Cobblewood Road, Livingston, N.J. 07039, and Louis R. M. Del Guercio, 14 Pryer Lane, Larchmont, N.Y. 10538

Filed Oct. 30, 1975, Ser. No. 627,341
Int. Cl.[2] A61M *5/20*
U.S. Cl. 128—214 F **5 Claims**



1. Portable, automatic fluid infusion apparatus for administering a predetermined amount of fluid at an adjustable, predetermined rate over an extended time period, the device comprising:

an elongated housing attachable to a patient;

a mechanical power means including a main spring enclosed by said elongated housing, said infusion apparatus including an elongated member extendable from a first end of said housing and in axial alignment with said elongated housing, said power means further including a timing mechanism, said timing mechanism including an escapement mechanism and a control mechanism to adjust the rate at which the fluid is administered, wherein said control mechanism includes a main driving disc operably engaged by said main spring, a driven disc operably engageable with said elongated member, a wheel for placing said driving disc in mechanical communication with said driven disc, and a shaft onto which said wheel is rotatably mounted for positioning said wheel along the radii of both said driving and said driven discs, for varying the speed at which the driving disc turns the driven disc; and

a receptacle means for storing the fluid, said receptacle means mounted at said first end of said housing in axial alignment therewith, said receptacle means including a soft plastic bag for holding the fluid, and a support platform for said soft plastic bag, said support platform fixedly attached to said first end of said elongated housing and in axial alignment therewith, said soft plastic bag positioned on said support platform in axial alignment with said elongated housing, said receptacle means further including a set of rollers fixedly attached to said support platform at a position adjacent said first end of said elongated housing, said soft plastic bag positioned between said set of rollers, said elongated member having a connecting means secured thereto for connecting said plastic bag to said elongated member, said elongated member for pulling said soft plastic bag through said rollers.

4,044,765

FLEXIBLE TUBE FOR INTRA-VENOUS FEEDING

William Mathes Kline, Gloversville, N.Y., assignor to Medical Evaluation Devices and Instruments Corporation, Gloversville, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,690
Int. Cl.[2] A61M *5/00, 25/00*
U.S. Cl. 128—214.4 **5 Claims**

1. A flexible intra-venous feeding tube including an inner body having proximal and distal ends and formed from stainless wire as a continuously wound lumen-defining helical spring with a majority of the helices thereof in contact with each other; an uninterrupted externally smooth transparent outer sheath having proximal and distal ends and formed from an inert plastic material so applied around said spring that its inner surface is firmly bonded thereto except at the proximal end portion thereof, the proximal end portion of said outer sheath being radially spaced from the adjacent of said spring whereby to define an annular void therebetween, the distal end of said outer sheath extending beyond the distal end of said spring and shaped to define a distally tapered hollow tip having an open distal end, a plurality of the helices of said spring being separated intermediate the proximal and distal ends thereof to provide a sight zone for visual observation of liquid flow; and a connected hub sealingly secured to the proximal ends of said spring and its said outer sheath, said hub having a proximal end portion provided with an axial socket for the initial retention of the handle of a puncture needle and for subsequent connection to a source of feeding liquid and terminating inwardly in a transverse web provided with a central aperture, said hub having a distal end bell housing provided

with two serially arranged cylindrical cavities coaxial with said central aperture, the distal one of said cavities having a diameter greater than that of the other thereof, a rigid sleeve affixed within the smaller diameter of said cavities and having a length to extend distally beyond the distal end of said bell housing, said sleeve having an inside diameter to receive and retain the unsheathed proximal end portion of said spring, means for securing the said proximal end portion of said spring within said sleeve, the proximal end of said outer sheath being fitted over the distal end portion of said sleeve and extending proximally into the annular void defined by the outer surface of said sleeve and the inner surface of said larger diameter cylindrical cavity, at least a portion of the wall of said larger diameter cavity being radially displaced inwardly whereby to secure the said proximal end portion of said outer sheath against the adjacent portion of said sleeve within said larger diameter cavity.

4,044,766

COMPRESSED CATAMENIAL TAMPONS WITH IMPROVED CAPABILITIES FOR ABSORBING MENSTRUAL FLUIDS

Leonard M. Kaczmarzyk; James J. Hlaban, both of Neenah, and Leo J. Bernardin, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 27, 1976, Ser. No. 661,971
Int. Cl.² A61F *13/00, 13/20*
U.S. Cl. 128—285 **9 Claims**

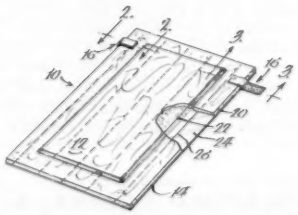
1. A compressed catamenial tampon comprised of a mixture of absorbent fibers in which a selected amount of said absorbent fibers are carboxymethylcellulose fibers having a degree of substitution in the range of 0.4 to 2.0 with at least a portion of the carboxyl radicals present being in free-acid form and the remainder of the carboxyl radicals present being in the alkali-metal salt form and in which said carboxymethylcellulose fibers are characterized by an absorbency time of less than about 41 minutes, said absorbency time being the number of minutes it takes for one gram of said carboxymethylcellulose fibers compressed to the 5cc mark in a 10cc BD multifit glass syringe to absorb a 0.9% NaCl solution up to the 5cc mark.

4,044,767

TAB FASTENER HAVING TWO TAPE SEGMENTS ATTACHED TO EACH OTHER AND TO DIAPER

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 27, 1976, Ser. No. 661,919
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **17 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a backing web folded over to form first and second anchoring legs each having an inner face and an outer face and receiving a marginal portion of the diaper therebetween, said inner face of said anchoring legs being provided with an adhesive coating by means of which said first anchoring leg is permanently attached to a marginal portion of said backing sheet and said second anchoring leg is permanently attached to a marginal portion of said facing sheet;

a securing tape segment having an inner face and an outer face and including a fixed end permanently attached to said backing sheet inwardly of said first anchoring leg, a free working end provided with a pressure-sensitive adhesive coating on said inner face thereof, and an intermediate portion of said tape segment between said fixed end and said free working end permanently attached to the outer face of said first anchoring leg;

release means associated with said tab fastener means and releasably attached to said adhesive coating on said free working end;

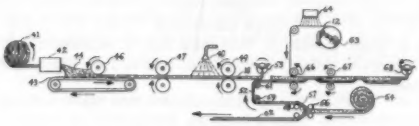
said free working end being separable from said release means to make said free working end available for securing said diaper about an infant.

4,044,768

DIAPER WITH SPLIT PUFF BONDED FACING

Frederick K. Mesek, Tinley Park, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 23, 1976, Ser. No. 660,607
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **13 Claims**



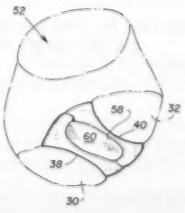
1. A multi-layer diaper comprising: a water-repellent backing member; an absorbent batt positioned on one face of said backing member; and a facing layer in juxtaposed relationship with respect to said batt and said backing member, said facing layer comprising a non-woven fibrous web including a randomly arranged, binder-stabilized, cellular, fibrous structure, said structure including chambers within the interior portion of the web surrounded by fiber strata more dense than the density within said chambers, and a binder interconnecting the fibers of said web, said binder being provided in sufficient quantity to prevent said fiber strata from collapsing, there being a density gradient between the opposite faces of said fibrous structure, the structure being more dense at one face than at the opposite face and having smaller chambers at one face than at the opposite face.

4,044,769

PANTY WITH SANITARY NAPKIN HOLDER

Elissa D. Papajohn, 65 Montague St., Brooklyn, N.Y. 11201

Filed Sept. 16, 1974, Ser. No. 506,229
Int. Cl.² A61F *13/16*
U.S. Cl. 128—288 **1 Claim**



1. In combination, a panty and the like having a front, rear

and opposite sides cooperating to define at least a lower torso garment having a waist opening and edges bounding right and left leg openings, elastic secured along said waist and leg openings to urge said edges of the latter into gripping contact with the user's legs to contribute to an optimum sealed confinement for a sanitary napkin during wearing service of said panty, and a sanitary napkin compartment formed of plies of fluid-tight material disposed in facing, superposed relation to each other in the crotch area of said panty, said compartment being oriented to extend between the front and rear of said panty and in substantial spanning relation between said elasticized leg openings, said compartment being further adapted to receive as a sanitary napkin a fluid absorbent material that is exposed to the interior of said panty through an opening defined in one of said plies in the interior of said panty, said opening extending for a substantial portion of the length of said compartment and for a width of said compartment sufficient to receive fluids discharged from the body of the user without side leakage from said compartment, and elastic secured along said compartment opening oriented substantially parallel to the elastic of said leg openings to retain the sides of said compartment opening about the absorbent material in said compartment without adverse effect on said seal of said elasticized leg openings, said panty supporting said compartment in position on the user such that the opening is restrained from movement relative to the body so that the compartment opening will remain in position to enable the absorbent material to receive the discharged body fluids.

4,044,770

EAR CURETTE

John J. Ocel; Donald J. Ocel, and Jon A. Mathisrud, all of Minneapolis, Minn., assignors to Ocelco, Inc., Minneapolis, Minn.

Filed Apr. 4, 1975, Ser. No. 565,003
Int. Cl.² A61B *17/22*
U.S. Cl. 128—304 **4 Claims**

1. An ear curette means comprising, in combination, a generally resilient self-supporting flexible gripping shaft with distal and proximal ends and having a wire loop means secured to the distal end thereof, and wherein:

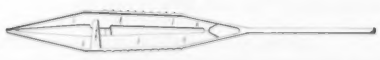
a. said gripping shaft having a generally rigid proximal end segment and a generally flexible distal end segment and being a generally solid shaft with a certain first diameter at the proximal end segment and a certain reduced diameter at the distal end segment and with a tapered step separating said distal end from said proximal end to provide a generally rigid proximal end segment and a generally flexible distal end segment, and wherein a shaft deflection of 35° is achieved with a load of from between 75 and 125 grams secured to the tip end thereof.

4,044,771

FORCEPS MADE IN ONE PIECE

Arne T. Wannag, 11 A Palnasvagen, 133 00 Saltsjobaden, Sweden

Filed Dec. 31, 1975, Ser. No. 645,602
Int. Cl.² A61B *17/30*
U.S. Cl. 128—354 **3 Claims**



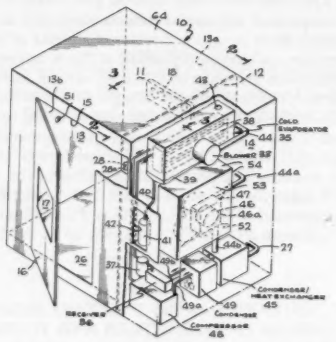
1. Forceps of one piece of material preferably a plastic material, comprising a pair of arms being joined together at one end thereof and having tips at their other free ends, said arms having a relatively short distance from their joining point two projections which face each other and are dimensioned to engage each other by abutment substantially when the tips of said arms contact each other, the portion of each of said arms which is located between said projection and said joining point being flexible, the portion of each of said arms between said tip being relatively rigid and for such purpose are dimensioned for a minimum deflection when said second portions are supported by the two spaced apart supports, that is said tips and said projections, and in use are to be manually pressed towards each other, said manual pressure acting intermediate said supports, said tips forming planar gripping surfaces facing each other and having a relatively large extension in the length direction as well as in the transverse direcion of said arms, said gripping surfaces forming such an angle with the rest of said arms that said gripping surfaces just when said projections engage each other by abutment will be in contact with each other along their entire surface.

4,044,772

APPARATUS FOR CARDIOVASCULAR CONDITIONING AND OTHER PHYSIOLOGICAL PURPOSES

Benjamin Schloss, 6961 Valjean Ave., Van Nuys, Calif. 91406

Filed Mar. 29, 1976, Ser. No. 671,592
Int. Cl.² A61H *33/06*
U.S. Cl. 128—371 **28 Claims**



1. A physiological apparatus useful for cardiovascular conditioning and other physiological purposes, comprising:

a chamber,

heater means for introducing heated air into said chamber at a controlled, elevated temperature to promote profuse perspiration of a nude person in said chamber, and

evaporation means for circulating said introduced heated air over said person in said chamber at a flow rate sufficient to achieve continued rapid evaporation of said perspiration and of moisture expired by said person, and for continuously, rapidly removing from said chamber air containing evaporated perspiration and expired moisture.

4,044,773

COLD THERAPEUTIC PACKAGE

Henry Clay Baldwin, III, 429 S. Bolmar St., West Chester, Pa. 19380

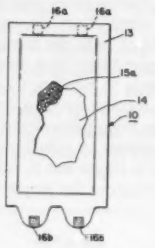
Filed Aug. 27, 1975, Ser. No. 608,270
Int. Cl.² A61F *7/04*
U.S. Cl. 128—402 **5 Claims**

1. The method of using a cold therapeutic package for local treatment, said package having a longitudinal axis, comprising the steps of

forming a generally flat layer of ice between sheets of polyurethane film materials;

fragmenting the layer of ice into a plurality of small, finely subdivided, randomly shaped and sized particles;

applying the package about an area to be treated; and



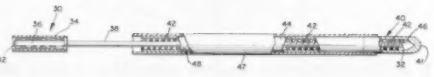
conforming the film materials and the fragmented particles to the contours of the area to be treated.

4,044,774

PERCUTANEOUSLY INSERTED SPINAL CORD STIMULATION LEAD

Terry Corbin, Crystal, and Duane J. Zytkovicz, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 23, 1976, Ser. No. 660,353
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—404 **21 Claims**



1. A lead adapted to be attached to and extended between first and second sources of electrical stimulation and animal tissue to conduct and apply such stimulation to the tissue, comprising:

a. a stimulation electrode of an electrically conductive material substantially inert to body fluids and tissues;

b. a first conductor having a distal end electrically connected to said stimulation electrode and extending therefrom a first distance along said lead to a proximal end thereof;

c. a first electrical contact electrically connected to said proximal end of said first conductor, and adapted to be connected to the first source of stimulation to be applied along said first conductor to said stimulation electrode for stimulating the animal tissue;

d. a second conductor having a distal end electrically connected to said stimulation electrode and extending a second distance along said lead to a proximal end of said second conductor, said second distance being greater than said first distance;

e. a second electrical contact electrically connected to said proximal end of said second conductor and adapted to be connected to the second source of stimulation whereby electrical stimulation may be applied through said second conductor to said stimulation electrode; and

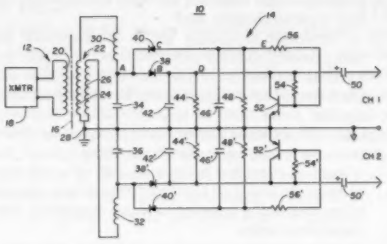
f. a sheath of an electrically insulating material substantially inert to body fluids and tissues and covering said first and second conductors between said stimulation electrode and said first and second contacts, said second conductor and said sheath covering said second conductor between said first and second contacts being of a reduced dimension, whereby said second conductor may be readily severed and removed from said lead.

4,044,775

IMPLANTABLE RECEIVER CIRCUIT

Larry A. McNichols, Coon Rapids, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 29, 1976, Ser. No. 681,766
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—421 **10 Claims**



1. A circuit included in a device implantable within a body for providing at a given rate pulses of a pulse signal to a lead connecting said device to bodily tissue, said device including means responsive to a signal applied external to said body and radiated to said device for providing an internal signal manifesting said externally applied signal to said circuit, said external signal being a series of alternating current pulse bursts which occur at given rate, said circuit comprising:

first means responsive to said internal signal for providing a pulse during the occurrence of each pulse burst;

output energy storage means coupling said pulse signal to said lead; and

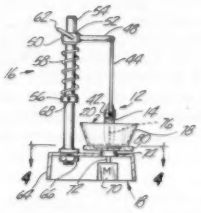
second means switchably engaged for providing a low resistance discharge path for said storage means during the time pulses of said pulse signal are not applied to said storage means.

4,044,776

CORN KERNEL CUTTER

Kenneth C. Moore, 5024 N. Lake Road, Columbiaville, Mich. 48421

Filed July 14, 1975, Ser. No. 595,765
Int. Cl.[2] A01F *11/06*
U.S. Cl. 130—9 D **7 Claims**



1. A device for severing kernels of corn from a cob, comprising:

a. means for rotating an ear of corn,

b. means for cutting the kernels from the ear, the means for cutting engaging the ear of corn as it rotates, the means for cutting comprising:

1. a pair of semi-circular cutting members, the members each having a portion thereof overlapping the other member, the members cooperating to define a circular cutting blade, and

2. means biassing the cutting members toward each other and enveloping the cutting members,

c. means for vertically moving the means for cutting, the means for moving comprising:
1. a pair of downwardly depending arms, each arm being connected to the cutting means,
2. a first movable member connected to the depending arms,
3. a second movable member spaced apart from the first movable member,
4. biassing means disposed between the movable members and secured thereto, and
5. a vertically extending shaft, the movable members being axially slidably mounted onto the shaft, such that vertical movement of the movable members along the shaft causes contemporaneous movement of the cutting means,

d. means for mounting the cutting means to the moving means, the mounting means comprising:
1. a pair of threaded arms, one end of each arm being removably attached to one of the cutting members, the other end being connected to an associated one of the depending arms,
2. biassing means mounted on each threaded arm, and
3. means for threadably securing each of the threaded arms to the associated depending arm, and

wherein the ear of corn is vertically aligned, the cutting means moving along the vertical extent thereof as the ear rotates.

4,044,777

SYNTHETIC SMOKING PRODUCT

Dennis Boyd, Belfast, Northern Ireland, and George Porter, London, England, assignors to Gallaher Limited, Belfast, Northern Ireland

Division of Ser. No. 352,238, April 18, 1973, Pat. No. 3,943,941. This application Dec. 1, 1975, Ser. No. 636,705

Claims priority, application United Kingdom, Apr. 20, 1972, 18315/72

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.[2] A24B *15/00*; A24D *1/18*

U.S. Cl. 131—2 **6 Claims**

1. The method of preparing a fuel for smoking by human beings which comprises the steps of agglomerating a plurality of flexible cellulose-base fibres containing only carbon, hydrogen and oxygen, into a coherent mass, and subjecting said mass to a controlled pyrolysis until said fibres have suffered a weight loss of at least 60% during the pyrolysis, having a cross-sectional dimension between 5 and 10 microns and an organic content which is at least 90% carbon by weight.

4,044,778

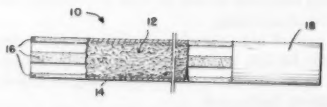
CIGARETTES

Charles C. Cohn, c/o Colonial Alloys Company, 4041 Ridge Ave., Bldg. No. 11, Philadelphia, Pa. 19129

Filed Sept. 10, 1973, Ser. No. 395,650

Int. Cl.[2] A24D *1/02*

U.S. Cl. 131—4 A **18 Claims**



1. In a cigarette having a body of tobacco enclosed by a combustible wrapper, a heat insulating coating on said wrapper making the cigarette self-extinguishing when in contact with a surface, said coating being deposited from an aqueous solution of a soluble alkali silicate containing from about 17 to 27 percent by weight of SiO_2, the coating area of the silicate solution on the wrapper being from about 40 to 84 percent of the entire wrapper area to produce a cigarette which is self-extinguishing when in contact with a flammable or other surface, said coating area being generally evenly distributed along the length of the wrapper to reduce the burning rate of the wrapper throughout its length and to limit the air access to the burning tobacco throughout the length of the wrapper.

4,044,779

MANUFACTURE OF FILTER-TIPPED CIGARETTES

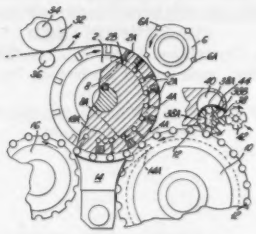
Edward George Preston, and Jan Antoni Rakowicz, both of London, England, assignors to Molins Limited, England

Filed Nov. 10, 1975, Ser. No. 630,517

Claims priority, application United Kingdom, Nov. 15, 1974, 49420/74

Int. Cl.[2] A24C *5/343*, *5/52*

U.S. Cl. 131—21 R **7 Claims**



1. A filter-attachment machine comprising a drum and a cooperating rolling plate between which assemblies of cigarette and filter portions are rolled in order to wrap connecting sheets around them to join the cigarette portions to the associated filter portions, including means for monitoring the regular passage of assemblies through the rolling area between the drum and the plate and for producing a fault signal when assemblies stop passing a given point in the rolling area at regular predetermined intervals.

4,044,780

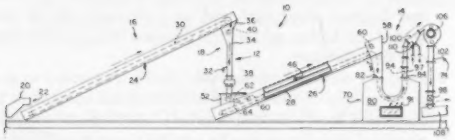
APPARATUS FOR TOTAL BLEND EXPANSION

James G. Kelly, Richmond, Va., assignor to American Brands, Inc., New York, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,740

Int. Cl.[2] A24B *3/18*

U.S. Cl. 131—135 **20 Claims**



20. Apparatus for increasing the filling capacity of cut tobacco material comprising first means for elevating the temperature of the tobacco to about above 130° F. and about below the temperature at which the tobacco becomes charred or discolored and moisture content of the tobacco such that the heating and moisturizing are performed for a time sufficient to permit cut tobacco to open from its compressed condition, means for forming a relatively thin dispersion of the opened

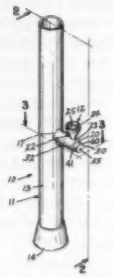
tobacco in a gas, and means operatively connected to said first means for rapidly lowering the moisture content of the thin dispersion of tobacco as the tobacco is maintained in the thin dispersion in a generally laminar gas flow to about its making moisture within about five seconds such that the tobacco has achieved an expanded and opened condition which resists the closing back thereof, said lowering means conveying a hot, relatively dry gas to reduce the moisture content of the tobacco and an expanding means for increasing the relative velocity of the air to the tobacco to wipe moisture from the tobacco surface.

4,044,781

SMOKING DEVICE

James E. Heggestuen, 1017 N. 14th St., Fargo, N. Dak. 58102

Filed Apr. 7, 1976, Ser. No. 674,327
Int. Cl.[2] A24F *1/14, 1/26*
U.S. Cl. 131—173 **5 Claims**



1. A smoker's pipe comprising, in combination:

a bowl assembly including

a hollow cylinder having an inwardly shouldered end, a medical radial lighting opening, and a distal radial filler opening;

a hopper mounted at said distal opening for supplying smoking material;

a plunger movable axially in said cylinder and having a generally axial bore, a radial bowl cavity of generally the same cross-sectional outline and size as said filler opening, and perforations connecting said bore with the bottom of said bowl cavity;

and spring and guide means acting between said shoulder and said plunger to urge the latter out of a first position, in which said bowl cavity is aligned with said medical opening, and a second position, in which said bowl cavity is aligned with said distal opening, said medial cavity is closed, and a first end of said plunger projects beyond the unshouldered end of said cylinder;

flexible conduit means secured to the inner end of said plunger, in communication with said generally axial bore, for moving said plunger within said cylinder;

an inhalation and liquid chamber comprising a vertical tube, means capping the lower end of said tube so that the latter may be filled with liquid to a desired level, and a lateral aperture located above said desired level;

and means securing said shouldered end of said cylinder in said lateral aperture with said flexible conduit extending toward the bottom of said chamber to terminate below said desired level.

4,044,782

ACID TREATED POLYESTER POLYURETHANE FOAM END WRAP

David Martin Adrion, Phoenix, Ariz., and Lloyd Bruce Hartsough, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 26, 1976, Ser. No. 670,594
Int. Cl.[2] A45D *7/00*
U.S. Cl. 132—7 **9 Claims**

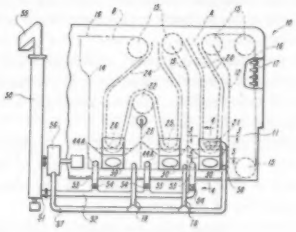
1. An end wrap for use in the permanent waving process which comprises a permeable flexible wafer of open-celled polyester polyurethane foam having a thickness of from about one-sixteenth inch to about one sixty-fourth inch, an average pore incidence within the range of from about 30 to 120 pores per linear inch and, contained in said end wrap, a solid, carboxylic acid having a pK_1 of from about 2.5 to about 6.0 and a water-solubility of from about 0.1 to 10.0 parts acid per 100 parts water at 15°–20° C., said acid being present at a level of at least 5 milligrams of acid per cubic inch of foam.

4,044,783

LABEL REMOVAL APPARATUS FOR CONTAINER WASHING MACHINES

Momir Babunovic, Des Peres, and Donald E. Whitlock, Creve Coeur, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Mar. 22, 1976, Ser. No. 669,043
Int. Cl.[2] B08B *3/04, 9/08*
U.S. Cl. 134—73 **11 Claims**

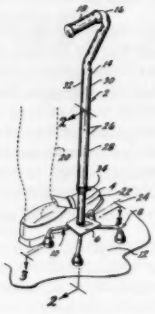


1. Label removal apparatus for washing machines for containers bearing removable labels and for removing the detached labels from the machine, comprising: a washing solution containing compartment formed by and between side walls and walls transverse to said side walls; guide means extending downwardly in said compartment; label collecting trough means connected to said guide means and spaced above the bottom of said compartment, said guide means directing labels into said trough means, container conveying means movable through said compartment in descending and ascending paths outside of said guide means so as to have a path of travel beneath said trough means from the descending path to the descending path; an assembly of baffle means spaced below the path of travel of said conveyor means and above the compartment bottom to define a bottom space below said trough means; washing solution and label transfer passage means forming a communication between said trough means and said bottom space; fluid directing nozzle means in said trough means adjacent said transfer passage means to create a flow current for moving washing solution burdened with labels from said trough through said transfer passage means into said bottom space, and outlet means for washing solution burdened with labels connected into said bottom space.

4,044,784
WALKING AID CANE

Alfred A. Smith, 13114 Margate St., Van Nuys, Calif. 91401

Filed Mar. 1, 1976, Ser. No. 662,525
Int. Cl.[2] A45B 1/00; F16M 13/08
U.S. Cl. 135—67 16 Claims

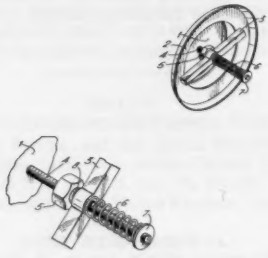


1. A walking aid cane construction comprising:
a central support member having an upper end, a lower end and a longitudinal axis;
four legs rigidly connected to said lower end for contact with a supporting surface;
each of said legs having a body portion and a foot portion;
the body portions of said legs being generally transversely connected to said member with the foot portions depending downwardly from the outer ends of the body portions for contact with a supporting surface;
said support member having an inner region that faces the user's leg and an outer region that faces away from the user's leg;
said foot portions having lower ends which are positioned in a plane that is generally transverse to said support member with said lower ends positioned generally at the corners of a rectangle within said plane;
said support member having a front region which faces generally in the direction of movement of the user and a rear region which faces generally in a reverse direction to said direction of movement;
said rectangle having a front side and a rear side which are generally parallel and are positioned generally transverse to the direction of movement of the user;
said rectangle having an inner side and an outer side which are generally parallel and are positioned generally in alignment with the direction of movement of the user;
said inner side being positioned closer to the axis of said support member than said outer side and said front side and said rear side being positioned at about the same distance from the axis of said member;
said rectangle having inner corners formed by intersection of said inner side with said front and rear sides and outer corners formed by the intersection of said outer side with said front and rear sides;
the body portions of the legs which terminate at said inner corners being shorter than the body portions of the legs which terminate at said outer corners;
handle means adjustably connected to said support member for vertical positioning with respect thereto and being aligned with the direction of travel, and
support means to provide support for supported lengths of said body portions with the support means being shaped and positioned to provide unsupported lengths of the body portions which have a substantially equal resistance to bending forces.

4,044,785
COMBINED, ADJUSTABLE AIRING VALVE AND FIRE PROTECTION VALVE

Ole Arvid Larsen, Michelets vei 38C, Oslo 10, Norway

Filed Jan. 22, 1976, Ser. No. 651,348
Claims priority, application Norway, Jan. 31, 1975, 750302
Int. Cl.[2] F16K 17/38
U.S. Cl. 137—75 3 Claims

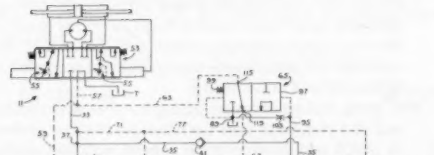


1. In a combined adjustable airing valve and fire protection valve comprising a valve head shaped commensurate with a valve seat, a valve stem fixed to said valve head and in the form of an adjusting screw, a fusible structure responsive to temperature taking the form of a threaded portion of an adjustable nut threadably engaged with the valve stem, a support bracket supporting and guiding the valve stem, and a biasing means arranged between the support bracket and a stop plate on the valve stem to bias the valve head towards the valve seat thereby abutting the adjustable nut against the support bracket, the improvement being that the adjustable nut is disposed on the valve stem with sufficient friction such that the adjustable nut rotates with the valve stem if the valve head is rotated, so that the valve head cannot be undesirably displaced, and the adjustable nut is disposed on the valve stem between the supporting bracket and the valve head.

4,044,786
LOAD SENSING STEERING SYSTEM WITH DUAL POWER SOURCE

James K. Yip, Richfield, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed July 26, 1976, Ser. No. 708,657
Int. Cl.[2] F15B 11/16, 18/00
U.S. Cl. 137—101 7 Claims



1. A system for providing pressurized fluid to a primary load circuit end to an auxiliary load circuit means, the primary load circuit including means providing at least one load pressure signal representative of the demand for fluid pressure and flow by the primary load circuit, said system comprising:
a. a first sub-system including a first source of pressurized fluid and a first valve means operable in response to varia-

tions in the load pressure signal to control the flow of fluid from said first fluid source to the primary load circuit to satisfy the demand for fluid thereby, and to port excess fluid to the auxiliary load circuit means when the fluid demand by the primary load circuit is less than the output capacity of said first fluid source;

b. a second sub-system including a second source of pressurized fluid and a second valve means operable in response to variations in the load pressure signal to control the flow of fluid from said second fluid source to the primary load circuit to satisfy any demand for fluid thereby in excess of the output capacity of said first fluid source and to port any excess fluid from said second fluid source to the auxiliary load circuit means; and

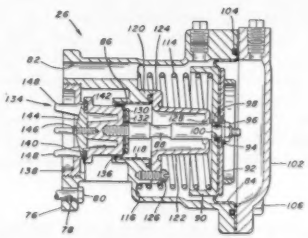
c. third valve means operable to communicate the load pressure signal to said second valve means to cause said second valve means to be responsive thereto, when said first valve means is porting all of the fluid from said first fluid source to the primary load circuit, and to block the communication of the load pressure signal to said second valve means when said first valve means is porting excess fluid from said first fluid source to the auxiliary load circuit means, the load pressure signal acting on said second valve means being relieved to tank by said third valve means.

4,044,787

BACKFLOW PREVENTER AND RELIEF VALVE ASSEMBLY

Ray Sutherland, Hopwood, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 668,627, March 19, 1976, Pat. No. 3,996,962. This application July 19, 1976, Ser. No. 706,349
Int. Cl.² E03B 7/07
U.S. Cl. 137—107 **5 Claims**



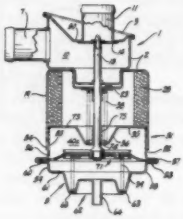
1. A pressure differential operable valve comprising: a body having an inlet and an outlet and a seat between said inlet and outlet; said inlet being connected to a fluid flow line; a valve member engageable with said seat for controlling flow therethrough; a valve stem connected with said valve member; means including a pair of diaphragms providing a first pressure chamber therebetween; means connecting said diaphragm with said valve stem, said valve body including an opening communicating with said first pressure chamber for admitting operating fluid into said first pressure chamber; a second pressure chamber defined by one of said diaphragms and the cover of said body, and being connected to a source of line pressure upstream of said opening communicating with said first pressure chamber; a spring operatively connected to said valve stem and biasing said valve member toward the valve opening position; said operating fluid normally effective in said second pressure chamber to oppose said spring bias and move said valve stem and valve member toward valve closed position; the other of said diaphragms adding force of pressure in said first pressure chamber to move said stem and said member toward valve closed position.

4,044,788

DIAPHRAGM ACTUATED VALVES

Edward N. Crawford, Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,957
Int. Cl.² G05D 11/00
U.S. Cl. 137—117 **3 Claims**



1. In a valve structure including an air connection part having inlet, outlet and bypass openings in it, said air connection part including a valve seat operatively associated with said outlet opening, a diaphragm chamber part having a diaphragm assembly including a flexible diaphragm dividing said chamber into a first section and a second section, a valve stem having first and second ends, said first valve stem end being attached to said diaphragm, and a valve member mounted to said second valve stem end, the improvement which comprises means for providing fail safe operation of said valve, said means including a first spring mounted in said first section of said diaphragm chamber part adapted to bias the diaphragm so as to seat said valve member, means for supplying a source of negative pressure to said chamber coupled to said chamber on the same side as said diaphragm as said first spring, said first section of the diaphragm chamber part including stop means for limiting the movement of said diaphragm integrally formed in it, a muffler portion between said air connection part and said diaphragm chamber portion, said muffler portion including a valve seat about said bypass opening, a second valve member mounted to said valve stem, said second valve member being movable independently of said valve stem, and means for biasing said second valve member towards said seat about said bypass opening.

4,044,789

SANITARY DIVERSION VALVE

John E. Elmore, P.O. Box 474, Oak Hill, W. Va. 25901

Filed Jan. 12, 1977, Ser. No. 758,640
Int. Cl.² F16K 11/07
U.S. Cl. 137—367 **15 Claims**

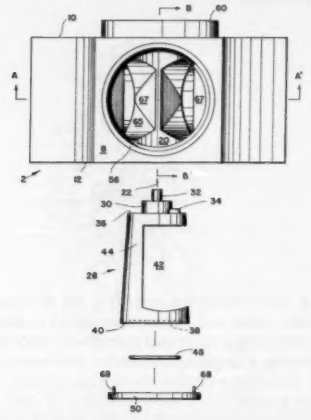
1. An improved sanitary diversion valve, for connection to plastic sanitary pipe, comprising:

a molded housing having three side surfaces, a top and a bottom surface, with an inlet port in a first one of said side surfaces and first and second outlet ports in second and third ones of said side surfaces, with a frusto-conical core receiving cavity having an axis substantially perpendicular to said top surface and opening onto said top surface through a core shaft port and opening onto said bottom surface through a core insertion port, said cavity communicating with said inlet and said first and second outlet ports;

a frusto-conical valve core having a shaft extending from its narrower top end, a circular depression engraved in its larger bottom and coaxial with the conical axis, and a trough in the conical side thereof, transverse to said conical axis, said valve core inserted through said core insertion port of said housing with said shaft extending through said shaft port of said housing and said conical side of said valve core mating with the inner conical surface of said housing cavity, for selectively connecting said inlet port

with either said first or said second outlet port by axially rotating said core within said cavity, to align said trough with said first or second outlet port;

a resilient O-ring positioned in said circular depression of said bottom end of said core;



a bottom plate mounted to said bottom surface of said housing over said core insertion pipe, for pressing upwardly against said O-ring, to resiliently seat said conical surface of said core with the mating inner conical surface of said cavity in said housing.

4,044,790

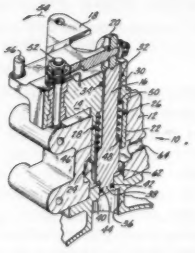
SELF RE-ARMING VALVE

Normand N. Rodrigue, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 27, 1976, Ser. No. 690,543

Int. Cl.[2] F16K *17/04*

U.S. Cl. 137—465 **2 Claims**



1. A self re-arming dump valve for use in controlling a pressurized fluid comprising:

a valve port,

a valve piston,

means for guiding said piston into said port,

a spring for biasing said piston into said port,

means for holding said piston from being forced out of said port by the pressurized fluid and for releasing said piston to permit opening of said valve by said fluid comprising a valve stem attached to said piston on the side opposite of the pressurized fluid, a roller follower to engage said valve stem and a spring to position said follower into engagement with said valve stem, and

means for stabilizing said valve with said piston in said port comprising a detent in the end of the valve stem that is not attached to said piston, to co-act with said roller follower.

4,044,791

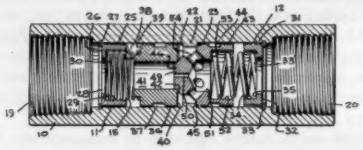
VALVE ASSEMBLY

Roland W. McKenzie, Culpeper, Va., assignor to City Tank Corporation, Culpeper, Va.

Filed Dec. 10, 1975, Ser. No. 639,600

Int. Cl.[2] F16K *17/18*

U.S. Cl. 137—493.9 **16 Claims**



1. A flow control valve assembly for providing fluid flow at varying rates in accordance with the input pressure of fluid to the valve assembly comprising a body having a fluid passageway therethrough including first and second ports, engageable first and second valve elements movably disposed in said fluid passageway between said ports, means disposed on said body for yieldably biasing said first valve element into engagement with said second valve element, means disposed on said body for yieldably biasing said second valve element into engagement with said first valve element, abutment means disposed on said body engageable by said first and second valve elements for restricting the movement of each of said valve elements toward the other thereof under the influence of said biasing means, said first valve element having a main fluid passageway therethrough intercommunicating said first port and said second valve element when said valve elements are disposed in engagement, said second valve element having a primary fluid passageway therethrough intercommunicating said main fluid passageway of said first valve element and said second port when said valve elements are disposed in engagement, and said second valve element having at least one secondary fluid passageway intercommunicating said first valve element and said second port whereby liquid flow at a relatively high rate of flow occurs through said primary fluid passageway and said secondary fluid passageway and said main fluid passageway when the input pressure is above a predetermined value with flow being restricted at a lower rate to the primary fluid passageway and the main fluid passageway when the input pressure is below a predetermined value.

4,044,792

DIAPHRAGM OPERATED PRESSURE REGULATOR

Knud Kjaergaard, Ballerup, Denmark, assignor to Odin Clorius A/S, Kovlunde, Denmark

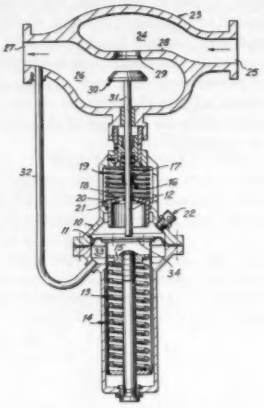
Continuation-in-part of Ser. No. 588,338, June 19, 1975, abandoned. This application May 28, 1976, Ser. No. 691,081

Int. Cl.[2] F16K *31/12*

U.S. Cl. 137—505.22 **3 Claims**

1. In a throttle valve comprising a valve housing having a high pressure chamber with a high pressure inlet port and a low pressure chamber with a low pressure outlet port, a wall having a valve seat therein separating said high and low pressure chambers, a valve element comprising a valve spindle positioned in said valve housing, said valve spindle extending movably through the outer wall thereof for movement of said valve element in a direction towards and away from abutment against said valve seat by means of a pressure regulator acting against the outer end of said spindle, said pressure regulator comprising first and second housing parts sealingly separated from each other by a diaphragm, the second housing part and said diaphragm defining a regulator pressure chamber being connected through adequate tubing to the low pressure chamber of said throttle valve, said diaphragm having secured thereto and placed centrally thereof a rigid member being biased by a preselected spring force acting against the force exerted upon said diaphragm by the pressure in said regulator

pressure chamber so as to define a balanced axial position of said rigid member within said regulator housing in response to the actual pressure within said regulator pressure chamber, a stem mounted to slide axially in said first housing part for abutment with its outer end against the outer end of said valve spindle and with its inner end against said rigid member and being relatively slightly biased by a spring force thereagainst, the improvement comprising a slide member mounted in said first housing part for sliding movement in a generally axial direction thereof in sealing contact around said stem and against the surrounding portions of said first housing part so as to define a generally closed chamber together with said dia-



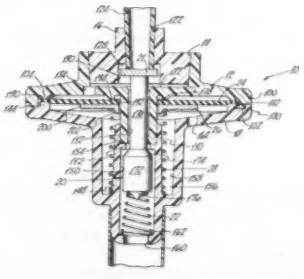
phragm and situated on the side thereof opposite said regulator pressure chamber, first abutment means provided on said first housing part, said slide member being in its normal position under normal operational conditions of said pressure regulator relatively slightly biased against said first abutment means, said stem extending slidably through a central bore in said slide member and having in the normal position of said slide member spaced outside thereof second abutment means adapted to engage against sad slide member when the latter during failure of said diaphragm is moved away from its normal position by fluid pressure acting thereon, so as to move said stem and thereby said valve element against its closed position.

4,044,793

RELIEF VALVE

Kenneth Keith Krueger, Tustin, and Todor Pavlov, Laguna Niguel, both of Calif., assignors to Shiley Laboratories, Inc., Irvine, Calif.

Filed Aug. 25, 1975, Ser. No. 607,265
Int. Cl.[2] F16K *11/20*
U.S. Cl. 137—612.1 **24 Claims**



1. A relief valve for preventing greater than a predetermined fluid pressure from being applied through a main passage to the outlet of the valve, comprising, in combination:

a generally circular inlet member having on one side, peripheral diaphragm sealing ridge, an annular valve seat ridge interior to and concentric with the diaphragm sealing ridge, and a tubular main fluid conductor extension having a main fluid passage therein, said conductor being interior to and concentric with the valve seat ridge, said inlet member also forming, on the other side, an opening for receiving a luer tip adapter and a passage through the inlet member in communication with the luer tip receiving opening and the annular space between the diaphragm sealing ridge and the valve seat;

a luer tip adapter received in the opening therefore in the inlet member, said luer tip adapter having a luer inlet therethrough in fluid communication with the main fluid passage and with the passage to the space between the diaphragm and the valve seat;

a generally circular outlet member having a diaphragm sealing ridge constructed and adapted to cooperate with the diaphragm sealing ridge on the inlet member to secure and seal between said ridges the edge of a diaphragm, an annular tubular portion defining a main passage generally coaxial with the main passage in the inlet member, said main passage being in communication with an outlet on the opposite side of an in generally coaxially with the luer tip inlet, a valve seat formed in the main passage, the annular tubular portion being constructed and adapted to mate with the conductor extension of the inlet member for thereby forming the main fluid passage through the valve from the luer tip inlet through the main fluid passage to the outlet, the outlet member including at least one vent opening spaced laterally from the tubular portion;

a movable generally cylindrical main valve member disposed for axial movement in the main fluid passage, the main valve member having thereon a shoulder valving portion which seats, in the closed position, against the seat and having one end which extends through the main passage in the inlet member in spaced relation to the walls of the main passage to a point proximate the inside of the luer inlet for being moved axially upon insertion of a luer tip into the luer inlet to thereby move the shoulder away from the seat to open the main valve;

a coil compression spring bearing resiliently against the main valve member for resiliently biasing the main valve to the normally closed position;

an annular diaphragm sealed at its edges between the diaphragm sealing ridges of the inlet and the outlet members having an opening in the center thereof through which the conductor extension of the inlet member extends in spaced relation to the inside edge of the annular diaphragm, the portion adjacent the central opening forming a valving member for contacting the seat ridges on the inlet member;

an annular washer surrounding the conductor disposed on the opposite side of the diaphragm from the portion which contacts the seat ridges;

a compression spring bearing against the washer and received around the tubular portion of the outlet member for resiliently biasing the washer and the valving portion of the diaphragm toward the valve seat ridges; and

the passage through the luer inlet, through the inlet member, between the inside edge of the diaphragm and the conductor extension, and through the vent opening, forming a vent passage which is normally closed by the vent valve comprising the diaphragm valving portion and the seat ridge on the inlet member, the resiliency of the spring and of the diaphragm requiring a predetermined pressure to open the vent valve, the main passage being defined by the luer inlet, the luer tip receiving opening, the passage through the conductor extension of the inlet member and the tubular portion and outlet of the outlet member, whereby upon insertion of a luer into the luer inlet the main valve is opened and upon application of fluid pres-

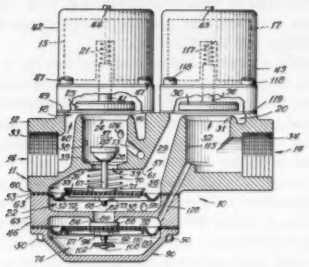
sure into the luer inlet above predetermined pressure value the vent opens the vent passage to thereby prevent application of pressure above said predetermined pressure valve from being applied through the main passage to the outlet.

4,044,794

SLOW-OPENING GAS VALVE

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Nov. 10, 1975, Ser. No. 630,166
Int. Cl.[2] F23N *5/24*
U.S. Cl. 137—613 **8 Claims**



1. A fluid flow control valve comprising a housing, including a main body portion having a central passageway interconnecting an inlet and an outlet of said valve, said main body portion having first and second ports formed therein between said inlet and said outlet of said valve, a first valve member disposed in open and close said first port, a second valve member disposed to open and close said second port, and regulator means interposed between said first port and said second port for regulating the flow rate from said first port to an inlet of said second port, said regulator means including regulator valve means having a regulating valve member disposed to normally close a regulator port disposed within said central passageway between said first and second ports, and first actuator means responsive to fluid flow through said first port following operation of said first valve member to open said first port to control said regulating valve member to open said regulator port to permit fluid flow at a first rate from said first port to said inlet of said second port, said second valve member being operable to open said second port to enable fluid supplied to said inlet of said second port to flow to said outlet, and control valve means responsive to fluid flow through said second port to control said first actuator means to increase the fluid flow rate through said regulator port to thereby increase the pressure of fluid supplied to said outlet to a predetermined value.

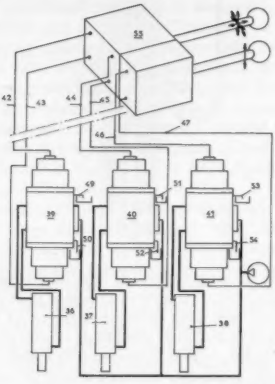
4,044,795

SELECTIVE AND PROPORTIONAL HYDRAULIC REMOTE CONTROL DEVICE, IN PARTICULAR FOR HANDLING AND PUBLIC WORK GEARS

Maurice Tardy, and Jean Paulet, both of Saint-Etienne, France, assignors to Bennes Marrel, France

Filed Jan. 20, 1975, Ser. No. 542,173
Claims priority, application France, May 31, 1974, 74.19652
Int. Cl.[2] F15B *13/042*
U.S. Cl. 137—625.6 **1 Claim**

1. A fluid control device comprising, in combination:
a fluid emitter including body means and piston means;
a source of fluid operably connected to said fluid emitter;
said body means including a first port, a second port and a third port;
said piston means being mounted in said body means for displacement therein;
said piston means being normally biased to a first position so that the first port, through which fluid from said source of fluid may be introduced into said fluid emitter, is closed, while the fluid which may flow from the third port is permitted to leave said fluid emitter through said second port;
said piston means being movable by an external force to a second position so that fluid from said source of fluid which is introduced into said fluid emitter through said first port is permitted to leave said fluid emitter through said third port, while the second port is closed;
said piston means being provided with control means for varying the effective fluid communication passageway between said first port and said third port;
said fluid emitter allows in particular the admission of the fluid sent under low pressure toward a distributor connected to said fluid emitter through an inlet port of said distributor, wherein said distributor is adapted to control operation of power members, such as jacks or the like;
said control means adjusts the pressure to the inlet port of said distributor, while the pressure of an outlet port of said distributor is constant;



said control means which adjusts the pressure of the inlet port of said distributor are grouped inside said fluid emitter;
said fluid emitter includes a body provided with at least one hollow piston which slides inside an axial bore in said body;
said control means includes calibrated holes drilled in a radial direction in said piston;
a control lever is provided attached to said hollow piston; and
the position of said control lever defines the number of said calibrated holes being obturated, the unobturated holes defining a section of said inlet port by opening in a chamber of pressure;
the fluid sent by said fluid emitter under low pressure acts on at least one piston connected to a slide valve of said distributor to control said slide valve;
said piston being provided with a hole parallel to its longitudinal axis; and
said hole being provided with a jet through which a controlled flowing out of the low pressure fluid takes place.

4,044,796

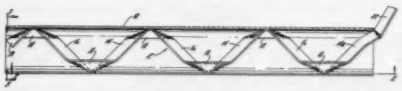
TURBULATOR

Ronald H. Smick, 745 Chapel St., Ottawa, Ill. 61350

Filed Feb. 9, 1976, Ser. No. 656,329
Int. Cl.[2] B01F *15/06*; F15D *1/02*
U.S. Cl. 138—38 **9 Claims**

1. An improved turbulator for insertion in a heat exchanger conduit having substantially straight longitudinal internal walls, comprising, an elongated strip of metal formed into a

series of alternating deflection panels successively joined together by substantially triangular bridging portions each having a pair legs forming an apex disposed laterally of the axis of said turbulator and joined to a base substantially parallel to said axis with said deflection panels along the length of said strip



merging into the legs of said triangular portions while alternately angling back and forth and simultaneously tilting up and down relative to said axis for mixing and directing heat exchanger fluid flowing within said conduit substantially completely circumferentially and uniformly against the internal walls of said conduit.

4,044,797

HEAT TRANSFER PIPE

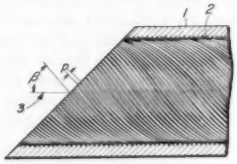
Kunio Fujie, Tokyo; Masaaki Itoh; Tamio Innami, both of Tsuchiura; Hideyuki Kimura, Chiyodamura; Wataru Nakayama, Kashiwa, and Takehiko Yanagida, Chiyodamura, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 14, 1975, Ser. No. 632,155

Claims priority, application Japan, Nov. 25, 1974, 49-134295; June 4, 1975, 50-66559; Sept. 22, 1975, 50-113692

Int. Cl.² F28F *1/40, 13/02, 13/12*

U.S. Cl. 138—38 **11 Claims**



1. In a heat transfer pipe for forced convection boiling or condensing the improvement comprising said heat transfer pipe being formed on its inner wall surface with grooves having a depth from the wall surface to their bottoms in the range between 0.02 and 0.2 millimeters, a pitch between the adjacent grooves in the range between 0.1 and 0.5 millimeters, and an angle of inclination with respect to the axis of the heat transfer pipe arranged between 4° and 15° or 165° and 176°.

4,044,798

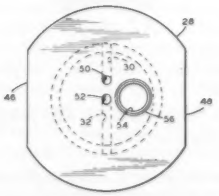
ADHESIVE BONDED HYDROTEST PLUG AND METHOD FOR USING THE SAME

Joel Gary Feldstein, and Jeffrey Forsha Martin, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 641,102

Int. Cl.² F16L *55/10*

U.S. Cl. 138—90 **2 Claims**



1. In a system using a test plug for testing the pressure integrity of that portion of a conduit member extending beyond the test plug, the conduit member being subjected to a fluid environment, the pressure characteristics of which vary from that of the environment surrounding the conduit member, the method of securing the test plug to the wall of the conduit member, the test plug having at least two internal passageways leading to the periphery of the test plug body, comprising:

placing and centering the test plug in the conduit member,

injecting a fluid adhesive through one of the passageways into an annular chamber between the periphery of the test plug and a wall of the conduit member while allowing gas to escape the annular chamber through another of the passageways, allowing the fluid adhesive to harden to form a fluid pressure tight bond between the test plug and the wall of the conduit member, and subjecting the conduit member to the fluid pressure environment.

4,044,799

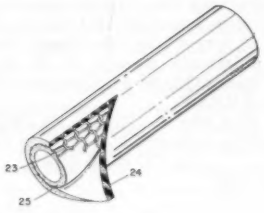
CELLULAR WALL HOSE AND METHOD FOR MAKING SAME

Charles D. Higbee, Arvada, and Bennie A. Stevens, Denver, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 724,928, April 29, 1968. This application Feb. 16, 1972, Ser. No. 226,675

Int. Cl.² F16L *11/00*

U.S. Cl. 138—125 **2 Claims**



1. An extruded, foamed, tubular product comprising:

an inner seamless tube having a multitude of closed gas-filled cells interspersed throughout the walls of said tube;

an outer cover comprising a wall structure having a multitude of gas-filled cells interspersed throughout said walls of the outer cover; and

at least one intermediate seamless, closed cell, cellular layer contiguous to the next adjacent inner layer and the next concentric outer layer.

4,044,800

LOOM WITH SHUTTLES

Cesare Germani, Como, Italy, assignor to Omita S.p.A., Italy

Filed Feb. 20, 1976, Ser. No. 659,950

Claims priority, application Switzerland, Feb. 27, 1975, 2483/75

Int. Cl.² D03d *51/40*

U.S. Cl. 139—341 **4 Claims**

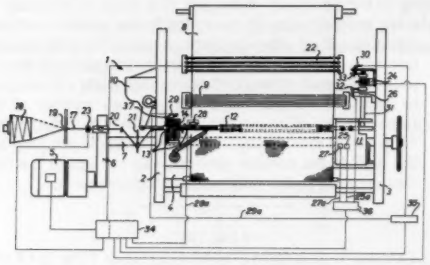
1. A loom having a monitoring system, said loom being of the type having a weft bobbin located outside the shed, the weft is fed into the shed by means of shuttles which are brought into a shooting position by a rotary transporting drum, said shuttles being braked after passing through the shed carrying the weft, said shuttles pass through a chute from the braking means to a conveyor belt and are then returned to the transporting drum by the conveyor belt, the operation of said shuttles and the position in the cylical path of each shuttle being monitored by said monitoring system which comprises:

first sensing means in said braking means for determining the position of said shuttle after passing through said shed;

second sensing means in said chute for determining the

position of said shuttle at the beginning of its return movement;

third sensing means adjacent said transporting drum for determining the presence of said shuttle at the end of its return movement; and



fourth sensing means for detecting the rotational phase of said transporting drum with respect to the loom movement.

4,044,801

WEFT THREAD BEAT-UP MECHANISM FOR TRAVELLING WAVE SHEDDING LOOMS

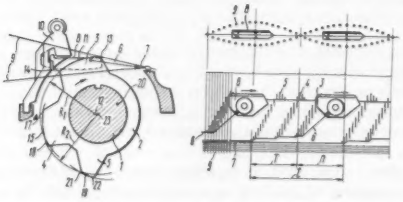
Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49, Moscow; Jury Ivanovich Komarov, ulitsa Miklukho-Maklaya, 29, korpus 1, kv. 215, Moscow; Alexei Vasilievich Butuzov, Balaklavsky prospekt, 38, kv. 61, Moscow, and Mazakhir Gamza Ogly Farzaliev, pereulok Mirza Fatalei, 13, Baku, all of U.S.S.R.

Filed May 12, 1976, Ser. No. 685,634

Claims priority, application U.S.S.R., May 15, 1975, 2134357

Int. Cl.[2] D03D *47/26*

U.S. Cl. 139—436 **5 Claims**



1. In a mechanism for beating up a weft thread in a travelling wave loom, a rotary shaft and a plurality of discs distributed along and carried by said shaft for rotation therewith, each disc having, for beating up a weft thread, at least a pair of teeth one of which is a leading tooth and the other of which is a trailing tooth in the direction of rotation of each disc, each of said teeth having leading and trailing edges projecting outwardly from the center of each disc and respectively terminating in outer ends, and each tooth having an outer convex edge extending between said ends of said leading and trailing edges of each tooth and having opposed ends joining said ends of said leading and trailing edges of each tooth respectively at leading and trailing merging points of each tooth, the trailing merging point of said trailing tooth being situated at a greater radial distance from the center of each disc than the trailing merging point of said leading tooth while the latter trailing merging point of said leading tooth is situated at a greater radial distance from the center of each disc than the leading merging point of the trailing tooth, said trailing tooth having a central portion of its outer convex edge situated at the same radial distance from the center of each disc as the trailing merging point of said leading tooth, so that during beating up of a weft thread at least said trailing tooth does not engage the weft thread with its leading merging point and instead provides for beating up of the weft thread primarily by engaging the latter thread at the central portion of said outer edge of said trailing tooth with the beating up action by said trailing tooth continuing up to the trailing merging point thereof.

4,044,802

MECHANICAL MULTIPLIER FOR WEAVING LOOMS

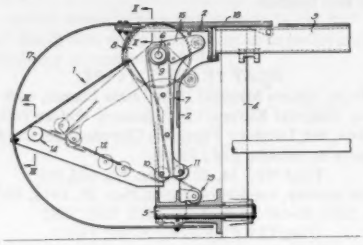
Patrick A. Steverlynck, Vichte, Belgium, assignor to N. V. Weefautomaten Picanol, Ieper, Belgium

Filed Sept. 7, 1976, Ser. No. 720,593

Claims priority, application Netherlands, Sept. 19, 1975, 7511118

Int. Cl.[2] D03D *47/00*

U.S. Cl. 139—449 **4 Claims**



1. Mechanical multiplier for weaving looms, characterized by the combination of: a pivotally mounted driven rocker lever; a gear which meshes with the part to be driven; a pinion fixedly attached to said gear; and a flexible elongated element trained over said pinion and, guided over two rollers journalled on one end of said rocker lever remote from its pivot mounting and both ends of which are attached to fixed points of the device.

4,044,803

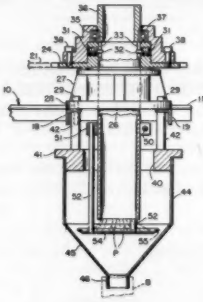
APPARATUS FOR FILLING CONTAINERS WITH DEHYDRATED AGGLOMERATES

Woodrow A. Baker, 13979 Allen Road, Albion, N.Y. 14411

Filed Oct. 14, 1975, Ser. No. 621,875

Int. Cl.[2] B65B *1/14*

U.S. Cl. 141—34 **5 Claims**



1. A machine for filling containers with predetermined quantities of dry particles, comprising

a frame,

indexing means including a drive shaft mounted on said frame to be intermittently rotated in one direction about its axis,

a sleeve mounted on said frame for intermittent rotation by

said drive shaft and coaxially about a vertical axis, said sleeve having an unobstructed axial bore disposed to be filled with said dry particles,

means for connecting said bore of said sleeve adjacent its upper end to a supply of said dry particles to be filled thereby,

a plate mounted on said sleeve for intermittent rotation therewith, and extending transversely across said lower end of said sleeve in axially spaced relation thereto partially to obstruct the opening in said lower end of said sleeve thereby normally to cause the particles filling said bore in the sleeve to pile up on the upper surface of said plate and to accumulate in said sleeve above said plate and the pile of particles thereon,

said indexing means further including means connecting said sleeve to said shaft and operative to transmit the intermittent rotation of said shaft simultaneously to said sleeve and to said plate, and whereby each time said shaft is rotated said sleeve and said plate are rotated a fraction of a revolution about the axis of said sleeve so that a predetermined quantity of said particles is discharged by centrifugal force radially off the edge of said plate from said pile, and said pile is replenished by gravity from the particles accumulated in the unobstructed bore of said sleeve, and

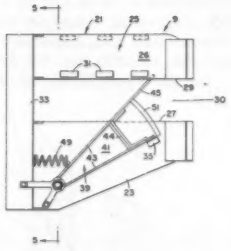
means for guiding into one of said containers said quantity of particles discharged from said plate.

4,044,804

TREE SHEARER

Wesley Lamar Dodd, Hamilton, Ga., assignor to Deere & Company, Moline, Ill.

Filed June 20, 1975, Ser. No. 588,770
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—34 E **15 Claims**



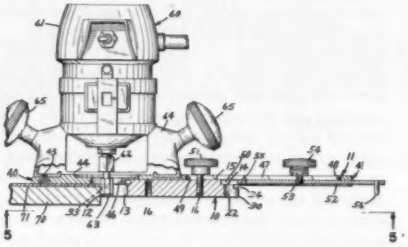
15. A tree shearing device, comprising: a frame member having edges defining a recess therein at a shearing area; a pivot member mounted on said frame member so that a portion of said pivot member is adjacent to said recess and within said shearing area; severing means mounted on said portion of said pivot member, whereby movement of said frame member in a predetermined direction causes said severing means to be moved toward one of said edges defining said recess so that a tree between said severing means and said one edge is sheared by continued movement of said frame member in said predetermined direction; and a guide member rigid with the pivot member and protruding outwardly from one edge of said severing means to assure pivoting of said pivot member when in contact with a tree.

4,044,805

ROUTER GUIDE UNIT

Donald D. Gronholz, 10941 Morris Ave. South, Bloomington, Minn. 55437

Filed Feb. 4, 1976, Ser. No. 655,278
Int. Cl.[2] B27C *5/10*
U.S. Cl. 144—134 D **5 Claims**



1. In combination:

a router having a flat base with a central aperture through which a selected router bit may project axially for peripheral engagement with the edge of a work piece;

a guide fence, having first and second flat faces, to be secured with respect to the router base with the first face of the fence turned toward the router, said fence including a straight edge having a length of the base, said edge being centrally interrupted by a recess of a width substantially the same as the diameter of the largest bit to be used;

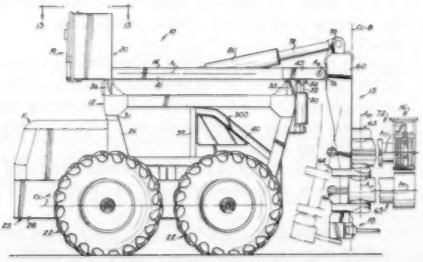
adjustable means for securing said fence flat against said router base, with said straight edge parallel to a line passing perpendicularly through the axis of the bit, said adjustable means enabling adjustment of said fence in a direction perpendicular to said straight edge, said adjustable means comprising a sub-base having a first face secured against said router base and having a second base remote from said router base including a groove extending radially with respect to the axis of said center aperture, and said fence including a tongue projecting from said first surface thereof and aligned with said direction of adjustment, and means adjustable along said groove independently of said fence and including at least one trammel point.

4,044,806

TREE PROCESSING MACHINE

Donald D. Savage; Robert V. Chambers, and Maurice T. Mills, all of Marietta, Ga., assignors to B. J. Powell, Atlanta, Ga., a part interest

Continuation-in-part of Ser. No. 293,482, Sept. 29, 1972, Pat. No. 3,881,533. This application Feb. 24, 1975, Ser. No. 552,318
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—309 AC **23 Claims**



1. A compact tree processing machine for cutting trees substantially longer than said machine including:

a prime mover movable along its longitudinal axis, and having a forward end and length substantially shorter than said tree to be harvested;

a support frame mounted on said prime mover and fixed relative to said prime mover;

a carriage frame pivotally mounted on said support frame for rotation about a roll axis spaced above, generally parallel to, and generally vertically aligned with the longitudinal axis of said prime mover, said carriage frame also longitudinally fixed with respect to said prime mover;

a support bed pivotally mounted on the forward end of said carriage frame about a single generally horizontal bed pivot axis generally perpendicular to said roll axis; said bed pivot axis spaced above said prime mover at the foward end thereof, longitudinally fixed with respect to said prime mover and generally vertically aligned with a point immediately forward of the support area of said prime mover for movement of said support bed from a generally vertical plane immediately forward of said prime mover to a generally horizontal plane above said prime mover; the remote end of said bed opposite said pivot axis being adjacent the ground when said bed is in the substantially vertical plane;

pivot means for selectively pivoting said bed about said pivot axis; and,

roll alignment means for selectively pivoting said carriage frame and said bed about said roll axis.

4,044,807

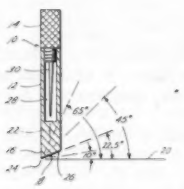
PIPE TOBACCO TAMPER AND METHOD

Ralph V. Swainson, 238 16th St., NE., Winter Haven, Fla. 33880

Continuation-in-part of Ser. No. 544,877, Jan. 29, 1975, abandoned. This application July 18, 1975, Ser. No. 596,978

Int. Cl.[2] A24F *3/02, 9/02*

U.S. Cl. 131—243 **10 Claims**



1. A pipe tamper for tamping tobacco in a pipe bowl having a draw opening in its bottom portion comprising,

a handle, and

a tamping head at one end of the handle having a face at an angle of from about 10° to about 65° to a plane extending at a right angle to a longitudinal line extending through the head, thereby providing the face with a leading edge and a trailing edge,

the head portion being of a size to fit within the pipe bowl and to cover up to about one-half of the tobacco's upper surface,

whereby tamping of the tobacco's upper surface with the leading edge adjacent the pipe bowl's inner surface while moving the pipe tamper around the inner surface compresses the tobacco at its outer edges substantially devoid of air pockets and leaves air pockets in its central portion.

4,044,808

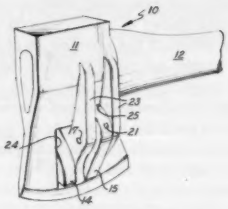
SPLITTING ASSEMBLY

Robert A. Kolonia, RD No. 3, Box 318, Agnes Lane, Milford, N.J. 08848

Filed May 20, 1976, Ser. No. 688,287

Int. Cl.[2] A47J *4/02;* **B26B** *23/00;* **B27L** *7/00*

U.S. Cl. 145—2 R **14 Claims**



1. A device useful for splitting objects comprising:

a. a head portion having a cutting edge located substantially on the centerline thereof,

b. means movably mounted directly on said head portion, and

c. said movable means being effective to move away from the head portion when the cutting edge is thrust against an object,

d. said movable means including lever means mounted to pivot about a point at one end thereof and swing the outer end thereof from a resting position outwardly with respect to a first side of the head portion,

e. said pivot point being laterally displaced with respect to said centerline and on a side of the head portion opposite said first side,

f. said head portion including an opening for receiving the outer end portion of the lever means,

g. said outer end portion being disposed at a location with respect to the cutting edge to be effective to enter into a cut made by the cutting edge when thrust against the object and having a structural configuration effective to cause the lever means to pivot about said pivot point.

4,044,809

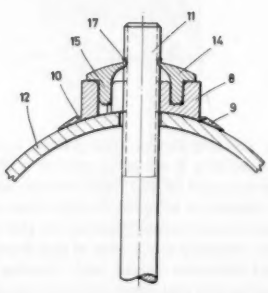
TIGHTENING AND SEALING DEVICE

Nicolás Guerrico Echevarría, Legazpia (Guipuzcoa), Spain, assignor to Plasticos Mel S.A., Legazpia (Guipuzcoa), Spain

Filed Feb. 13, 1976, Ser. No. 658,012

Int. Cl.[2] F16B *39/284, 39/36*

U.S. Cl. 151—19 R **3 Claims**



1. A tightening and sealing device, particularly for sealingly attaching a corrugated roofing element to a threaded stem extending through an orifice in the roofing element, said device comprising:

a tightening member including a central, cylindrical inter-

nally threaded body divided into a plurality of separate cylindrical segments by a plurality of radial and longitudinal slots, each of said cylindrical segments having extending outwardly from a first axial end thereof a leg, the legs of said segments being circumferentially spaced from each other, an outer body coaxially surrounding said central body, said outer body being joined at a first axial end thereof to said legs, said outer body having a cylindrical inner surface and a polygonal outer surface, said central and outer bodies defining therebetween an annular cylindrical channel open at second ends of said cylindrical segments and said outer body, said outer body having extending outwardly from said first end thereof a flexible annular skirt, said cylindrical segments, said legs, said outer body and said skirt being formed as an integral single member of a rigid plastic material;

said tightening member being axially slidable without rotation over a threaded stem until said skirt contacts a roofing element supported by the stem, said cylindrical segments being outwardly bendable at said legs during such sliding; and

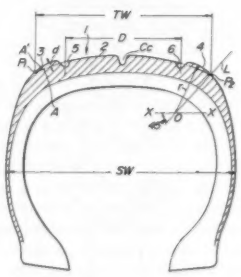
a sealing member including a cap-shaped element having extending therethrough an orifice to receive the threaded stem and having extending therefrom a cylindrical flange dimensioned to fit within and fill said annular channel, said flange when fitting within said channel forcing said cylindrical segments inwardly such that the internal threads thereof mesh with the threads of the stem, such that a wrench engaging said outer surface of said outer body can rotate said tightening member about the stem and into tight and sealing contact with the roofing element.

4,044,810

PNEUMATIC TIRE FOR AIRPLANES

Motoaki Taniguchi, Higashi-Yamato, and Toyomi Iwata, Sayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,860
Claims priority, application Japan, Oct. 23, 1974, 49-122137
Int. Cl.² B60C *11/06*
U.S. Cl. 152—209 R **8 Claims**



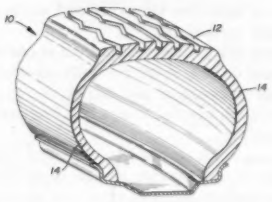
1. In pneumatic tire for airplanes comprising a plurality of circumferentially extending grooves and a plurality of circumferentially extending ribs separated from each other by means of said grooves, the improvement comprising, a pair of circumferentially extending grooves each arranged at a shoulder portion of the tire and substantially symmetrically and equally spaced apart from a crown center of the tire, the distance between said circumferentially extending grooves arranged at the shoulder portions being, when the tire is inflated, from 50% to 95% of a tread width and dividing a tread portion of the tire into a center zone and two shoulder zones, a sectional contour defining an outer surface of said tread portion being a continuous curve in both the center zone and the two shoulder zones, and the outer surface of the tire being protruded at both said shoulder zones from said circumferentially extending grooves arranged at the shoulder portions of the tire toward the outside thereof by a step projected from said tread portion even after said tire is inflated and having a level difference when the tire is uninflated from 0.5 mm to 6 mm, whereby a ratio of the load subjected to said center zone to the load subjected to said two shoulder zones is reduced, thereby improving the high speed durability of the tire without sacrificing the wear resistance thereof.

4,044,811

LAMINATED PNEUMATIC TIRE

Thomas J. Dudek, Tallmadge; Leon F. Marker, Cuyahoga Falls, both of Ohio, and Hendrik Jan Jacob Janssen, Den Haag, Netherlands, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed July 16, 1975, Ser. No. 596,494
Int. Cl.² B60C *5/12*
U.S. Cl. 152—354 **16 Claims**



1. In a pneumatic tire casing having a tread portion and flexible sidewall portions which are free of fabric reinforcement, the improvement wherein each of said sidewall portions comprises:

a series of layers of flexible polymeric material with a calculated molecular weight of at least 10,000 and a Shore A durometer hardness of at least 20,

a series of said layers comprising low-modulus polymeric material with a Young's modulus which is from about 100 to about 5,000 pounds per square inch,

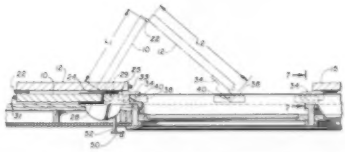
a plurality of said layers being interspersed with the low-modulus layers and comprising a higher-modulus polymeric material with a Young's modulus which is from about 3000 to 100,000 pounds per square inch, each of which layers has a Young's modulus at least twice that of the next adjacent low-modulus layer.

4,044,812

REMOTELY OPERATED WINDOW SHUTTERS

Paul W. Swanstrom, 505 McNamara Ave., Hastings, Minn. 55033

Filed Mar. 5, 1976, Ser. No. 664,161
Int. Cl.² E05D *15/26*
U.S. Cl. 160—206 **1 Claim**



1. A remotely operated folding shutter system for covering or uncovering an aperture in a building wall, comprising, in combination:

a first rectangular shutter panel pivotally mounted about a vertical axis with a first vertical edge adjacent to an edge of the aperture to be covered;

a second rectangular shutter panel having a width slightly greater than the width of said first shutter panel pivotally connected along one vertical edge to said first panel with

one vertical edge of said second shutter panel aligned adjacent to the second vertical edge of said first shutter panel;

track means mounted above and below said aperture in said building wall;

slide means mounted for slidable movement along said track along a straight path substantially parallel to said building wall;

guide means connected at one end to the other vertical edge of said second rectangular shutter panel and pivotally connected at the other end to said slide means;

a worm mounted on a rotatable shaft which projects through said wall;

a worm gear mounted on a frame for rotation about a substantially vertical axis, said worm gear being engaged with said worm to rotate about said vertical axis when said worm is rotated about its shaft axis;

a drive arm having one end fixed to said worm gear for rotation of said drive arm when said worm gear is rotated about said vertical axis;

a connecting link pivotally connected at one end to the free end of said drive arm and pivotally connected at its other end to an extension of said shutter;

a first cam block attached to said link, said cam block having a cam surface;

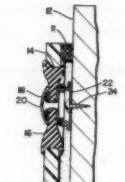
a mating cam block attached to said frame with cam surface cooperative with the cam surface of said first cam block, said cam surface operative when said shutter is perpendicular to said wall to limit the angular rotation of said link to within approximately 20 degrees of perpendicular, thereby to prevent a relative reversal of the direction of rotation of said shutter relative to rotation of said rotatable shaft.

4,044,813

ATTACHMENT MEANS FOR SCREEN OR STORM WINDOW

Oren L. Emmons, Rte. 4, 44th St., Allegan, Mich. 49010

Filed June 10, 1976, Ser. No. 694,697
Int. Cl.² A47H *3/00*
U.S. Cl. 160—369 **9 Claims**



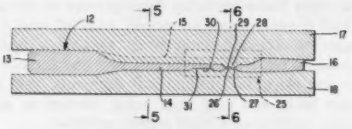
1. In a screen or storm window device that is removably mountable on first attachment means on a window casing or the like, the improvement wherein the periphery of the device is provided with a plurality of apertures therethrough disposed in spaced relation, a flexible and resilient grommet is mounted within each of said apertures, and second attachment means is secured to each grommet and is releasably engageable with said first attachment means, said grommets serving to enable movement of said second attachment means to insure proper mating of said first and second attachment means.

4,044,814

METHOD OF FINLESS COLD FORMING OF SEWING MACHINE NEEDLE

Josef Zocher, AAchen, Haaren, Germany, assignor to The Singer Company, New York, N.Y.

Filed July 16, 1976, Ser. No. 705,859
Int. Cl.² B21G *1/04*
U.S. Cl. 163—5 **7 Claims**



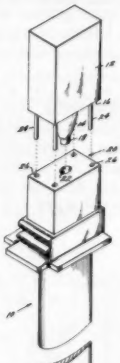
1. The method of cold forming a finless sewing machine needle comprising a butt portion and a blade portion of reduced cross-sectional area extending from said butt portion to a free extremity, comprising subjecting said entire blade portion to one finless flow pressing operation to form a continuous groove in said blade portion from the butt portion to closely adjacent said free extremity, and simultaneously, to form an eye portion along said continuous groove having a thin eye-accommodating web, punching an eye hole through said eye-accommendating web, and forming a point at the free extremity of said blade portion.

4,044,815

PRECISION INVESTMENT CASTING MOLD, PATTERN ASSEMBLY AND METHOD

Russell W. Smashey, and Dwight O. Bartell, both of Albuquerque, N. Mex., assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 1, 1976, Ser. No. 737,620
Int. Cl.² B22C *7/02*
U.S. Cl. 164—35 **9 Claims**



1. In a method for making a precision investment casting ceramic mold of the self-casting type, in which method a ceramic slurry is deposited on a wax pattern, the slurry is dried to provide a ceramic coating, the wax pattern is removed and then the ceramic is fired to create the mold, the improvement for making a unitary mold comprising the steps of:

providing separately a wax charge-holding assembly pattern and a wax article casting assembly pattern,

the wax charge-holding assembly pattern including:

i. a wax charge cup pattern having a bottom portion; and

ii. a wax plug cup pattern projecting from the bottom portion, and including a first alignment portion;

the wax article casting assembly pattern including:

i. an article pattern including a top portion; and

ii. a second alignment portion in the top portion shaped to cooperate with the first alignment portion of the plug cup pattern to align and maintain in spaced apart relationship the article casting assembly pattern and the charge-holding assembly pattern;

providing a plurality of refractory support and locating members;

securing together the charge-holding assembly pattern and the article casting assembly pattern to provide a composite wax pattern:

i. at the first and second alignment portions; and

ii. through the support and locating members by connecting the members between the charge-holding assembly pattern and the article casting assembly pattern, the members being disposed generally about the plug cup pattern; and then

making a reinforced unitary ceramic precision investment casting mold from the composite wax pattern.

4,044,816

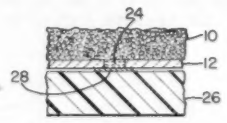
FORMATION OF METAL PARTS

Theodore H. Krueger, Lincoln; Robert Eller, Boston; John O'Brien, Winchester, and William L. Robbins, Newton, all of Mass., assignors to Theodore H. Krueger, Lincoln, Mass.

Division of Ser. No. 588,283, June 19, 1975. This application Jan. 12, 1976, Ser. No. 648,315

Int. Cl.² B22D *25/00, 27/16*

U.S. Cl. 164—63 **17 Claims**



1. Method of forming a material from the class consisting of metals and alloys as a solid part having a predetermined geometry, said method comprising the steps of:

a. providing a hollow body having at one end a porous surface and a non-porous surface that are made of substances which are not wettable by said material and are disposed so that a selected area of said porous surface is exposed through an opening in said non-porous surface;

b. immersing said one end of said hollow body in a melt of said material far enough so that said selected area of said porous surface contacts said melt;

c. withdrawing said one end of said hollow body from said melt with at least a portion of said selected area of said porous surface and at least a portion of said non-porous surface at a temperature at least as high as the melting point of said material,

d. providing a suction force on said porous surfaces as said body is withdrawn from the melt so as to cause a portion of said melt to adhere in liquid form to said selected area of said porous surface by suction; and

e. thereafter cooling the adhering portion of said melt by removing heat from said one end of said hollow body and removing said suction force so that said adhering portion is released from said porous surface and forms a solid part having substantially the same geometry as the exposed area of said porous surface.

4,044,817

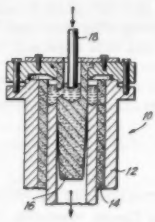
CONTINUOUS CASTING METHOD USING GRAPHITE MOLD IMPREGNATED WITH UNSATURATED DRYING OIL

William J. Varga, Woodbury, Conn., assignor to Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Filed Mar. 25, 1975, Ser. No. 561,701

Int. Cl.² B22D *11/00*

U.S. Cl. 164—138 **10 Claims**



1. In a method of continuously casting of a metal using a graphite mold or die having interstitial space, the improvement comprising, impregnating the interstitial space in said graphite mold or die with an unsaturated oil or a mixture of unsaturated oils, wherein the unsaturated oil or mixtures thereof have a drying capability equivalent to at least soybean oil, applying heat to dry the same, and casting said metal thereby carbonizing said oil or mixtures thereof in said interstitial space.

4,044,818

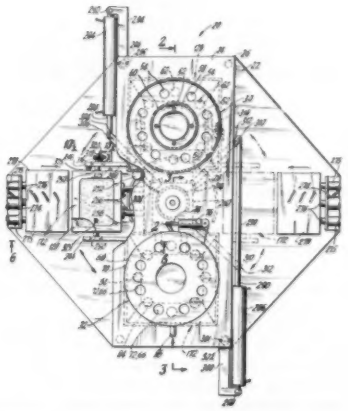
APPARATUS FOR FORMING SAND MOLDS

Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y. 11694

Filed Apr. 6, 1976, Ser. No. 674,131

Int. Cl.² B22C *15/08, 15/24, 11/04*

U.S. Cl. 164—172 **31 Claims**



1. Automatic sand mold fabricating apparatus comprising:

a. a first drag and a first cope;

b. first and second filling means defining first and second stations, respectively, for depositing a quantity of sand in said first drag and in said first cope;

c. first and second support means for positioning said first drag and said first cope in opposition to said first and said second filling means, respectively;

d. first and second impression forming means coopertively associated with said first drag and with said first cope at said first and said second stations, respectively;

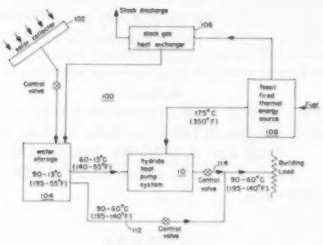
e. first and second actuating means for reciprocatingly moving said first and second impression forming means, respectively, wherein complimentary recesses are formed in the sand in said first drag and in said first cope with said recesses facing in the same direction;
f. displacing means for reciprocatingly moving said first drag and said first cope to and from a common, third station whereby said first cope is superimposed over said first drag;
g. first rotating means for reciprocatingly inverting said first drag before said first drag reaches said third station and before said first drag returns to said first station whereby said recesses in said first cope and said first drag are in opposition to each other; and
h. first ejection means for discharging the sand from said first cope and said first drag in the form of a mold at said third station.

4,044,819

HYDRIDE HEAT PUMP

James G. Cottingham, Center Moriches, N.Y., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 12, 1976, Ser. No. 657,519
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—1 **7 Claims**



1. A system for the transfer of thermal energy from a first temperature to and for use at an elevated, second temperature comprising:
a. first container means having within a hydrided first compound at a temperature below its decomposition temperature;
b. second container means having within a dehydrided second hydridable compound whose decomposition temperature is lower than the decomposition temperature of the first hydrided compound, the second compound being at a temperature below its decomposition temperature;
c. means communicating the interior of said first container means with said second container means forming a pressure sealed system;
d. means for heating the hydrided first compound above both of said second temperature and its decomposition temperature for a sufficient period to release its hydrogen and causing the pressure within both said container means to rise, said second compound being hydrided thereby, thermal energy being released by said second compound during hydriding at said second temperature until dehydriding is terminated in said first container means causing a decrease in pressure in said system;
e. means for thereafter cooling said first container means at said second temperature and exposing said second container means to a heat soruce at said first temperature reducing the pressure within said system sufficiently whereby said second temperature is above the decomposition temperature of said second hydride and said first compound is below its decomposition temperature at the reduced pressure, whereby said second hydride decomposes causing release of hydrogen which is absorbed by said first compound, said first compound releasing thermal energy at about said second temperature, said system effectively transferring thermal energy from said heat source at said first temperature for use at said second temperature.

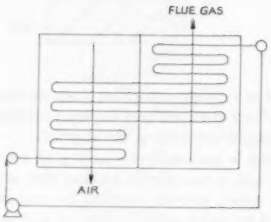
4. The method of pumping heat from a first temperature for use at an elevated, second temperature comprising the steps of:
a. heating a hydride of a first hydridable intermetallic compound to a temperature above its decomposition temperature causing its decomposition and relese of hydrogen;
b. exposing to said hydrogen in a pressure sealed system a second hydridable intermetallic compound having a decomposition temperature lower than that of the first compound at said secondtemperature which is below its decomposition temperature, thermal energy being released from said second compound at said second temperature, the pressure within said system rising during the aforesaid release of hydrogen; and
c. thereafter removing the source of heat from said first compound and exposing the hydride of said second compound to a source of heat at said first temperature, thereby reducing the pressure within said system to where the temperature of the hydride of said second compound is above its decomposition temperature and the temperature of said first compound is below its decomposition temperature, thereby causing the release of hydrogen from said second compound and the hydriding of said first compound, and effectively pumping heat from the source of heat at the first temperature for use at the elevated, second temperature.

4,044,820

METHOD AND APPARATUS FOR PREHEATING COMBUSTION AIR WHILE COOLING A HOT PROCESS GAS

Elon J. Nobles, Minnetonka, Minn., assignor to Econo-Therm Energy Systems Corporation, Minneapolis, Minn.

Filed May 24, 1976, Ser. No. 689,126
Int. Cl.[2] F28D *7/08, 15/00*
U.S. Cl. 165—2 **39 Claims**



1. A method for cooling a hot gas close to its dew point without causing condensation comprising
flowing air through a first chamber while flowing the hot gas to be cooled through a second chamber which is separated from the first chamber by a common wall, and
continuously flowing a heat transfer fluid having a high heat capacity as compared to said hot gas through the inlet end of heat transfer tubes which extend back and forth between the two chambers through said common wall in a serpentine path between the two chambers which extends in one direction and out the inlet end of the tubes at the opposite end of said serpentine path, whereby the heat which is adsorbed by the heat transfer fluid in each section of the tubes in the hot gas chamber is directly transferred to the air as the heat transfer fluid advances through the tubes in the first air chamber.

5. A heat transfer apparatus for heating combustion air while cooling a hot process gas close to its dew point comprising

a first chamber defining a combustion air zone through which air to be heated flows in a first direction along the longitudinal axis of the apparatus;

a second chamber adjacent said first chamber defining a process gas zone through which heated process gas flows in a second direction parallel to the longitudinal axis and opposite to said first direction;

a common wall between said two chambers thermally separating said combustion air zone and said process gas zone;

hollow conduit heat transfer means extending through said common wall and bending back and forth between said two zones to form at least one serpentine coil extending in one direction;

an inlet header at one end of said serpentine coil;

an outlet header at the opposite end of said serpentine coil; and

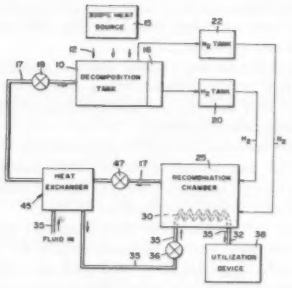
means to continuously circulate a heat transfer fluid through said inlet header, said heat transfer means between said two zones, and said outlet header, whereby the heat adsorbed by said fluid in the hot process gas zone is transferred to said combustion air.

4,044,821

LOW TO HIGH TEMPERATURE ENERGY CONVERSION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles G. Miller, Pasadena, Calif.

Filed Dec. 27, 1974, Ser. No. 536,786
Int. Cl.² F25B *13/00*
U.S. Cl. 165—2 **6 Claims**



1. A method for utilizing solar energy to produce superheated steam, the steps comprising:

concentrating solar energy to heat a first chamber to a temperature on the order of 300° C;

introducing into said first chamber a working substance which is gaseous and decomposes into first and second gaseous constituents at a temperature on the order of 300° C, whereby as said substance is heated to a temperature on the order of 300° C it decomposes into said two gaseous constituents;

continuously separating and removing said first constituent from the other constituent and the undecomposed working substance in said first chamber to produce an imbalance in the equilibrium gaseous content in said chamber to thereby promote the continued decomposition of said substance in said first chamber;

removing at least part of the second constituent from said first chamber;

recombining the separated first and second constiuents which were removed from said first chamber in a second chamber to reform the working substance, the recombination being accomplished by the release of heat which raises the temperature in said second chamber to a temperature on the order of not less than 500° C; and

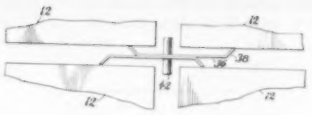
passing through said second chamber steam which absorbs heat present in said second chamber and is heated thereby to a temperature on the order of not less than 500° C to form superheated steam, for use in turbine electrical energy generation.

4,044,822

HORIZONTAL MODULAR INTER-GASKET SEAL

Richard Franklin Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Jan. 8, 1976, Ser. No. 647,533
Int. Cl.² F28D *19/00*
U.S. Cl. 165—9 **6 Claims**



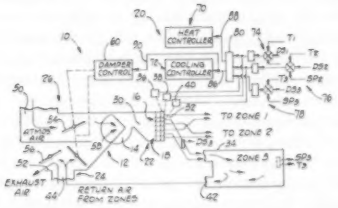
1. Rotary regenerative heat exchange apparatus having a horizontal rotor post, a plurality of circumferentially spaced open ended compartments carried by the rotor post to comprise a first annular element layer that extends around the rotor post, a second annular layer of element similar to said first layer and supported by the rotor post in axially spaced relation to provide an annular space therebetween, a mass of permeable heat absorbent material carried in the compartments of the rotor, housing means surrounding the rotor and including connecting plates at opposite ends thereof with openings for a heating fluid and a fluid to be heated, means for rotating the rotor about its axis to alternately align the heating element with the heating fluid and the fluid to be heated, and elongate sealing means extending radially through the space between annular compartment layers and having guide pins normal thereto that ride on the sides of laterally adjacent compartments.

4,044,823

METHOD AND APPARATUS FOR CONTROLLING AIR-CONDITIONING SYSTEMS

Frederick S. Biesecker, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Feb. 26, 1976, Ser. No. 661,620
Int. Cl.² F25B *29/00*
U.S. Cl. 165—16 **3 Claims**



1. In an air conditioning system having zone heating equipment, zone cooling equipment and a control system for governing operation of the heating and cooling equipment in response to electric analog zone temperature condition responsive signals from a zone sensor, the improvement comprising:

a signal amplifier having one input connected to the zone sensor and its output connected for controlling the heating and cooling equipment, said signal amplifier producing a command signal whose values vary in accordance with changes in sensed zone temperature conditions above and below a no load band of zone temperatures;

a command signal modifier means comprising a suppressor amplifier having one input connected to the signal ampli-

fier output and its output connected to said one signal amplifier input; and

a reference voltage source connected to the other inputs of said signal amplifier and said suppressor amplifier;

said suppressor amplifier rendered effective by a predetermined command signal value indicative of a sensed zone temperature in said no load band, said suppressor amplifier output, when effective, substantially preventing the signal amplifier output from varying from said predetermined command signal value in response to variations in sensed zone temperature within said no load band;

said suppressor amplifier output ineffective to prevent command signal variations in response to variations in sensed zone temperatures outside of said no load band.

4,044,824

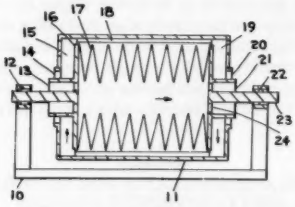
HEAT EXCHANGER

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 537,067, Dec. 30, 1974, Pat. No. 3,931,713, and Ser. No. 591,881, June 30, 1975, abandoned. This application July 14, 1975, Ser. No. 595,389

Int. Cl.² F25B *3/00*

U.S. Cl. 165—88 **5 Claims**



1. A heat exchanger comprising:

a. a support for shaft;

b. a shaft rotatably mounted on said support;

c. a heat exchanger housing mounted on said shaft to rotate therewith, said housing having an entry and an exit for a first fluid and an entry and an exit for a second fluid, a first fluid and a second fluid within said housing, a heat exchanger element within said housing to exchange heat between said first fluid and said second fluid, with said heat exchanger element separating said first fluid and said second fluid, said heat exchanger element being a convoluted bellows type member with the folds of the bellows being transverse to the housing shaft said bellows type member having radially outwardly extending heat conductive members alternately connected at their outward ends to form a first set of folds and connected at their inward ends to form a second set of folds, said first and second set of folds forming a continuous fluid tight heat exchanger element separating the two fluids, said first set of folds being open inwardly toward the heat exchanger center and filled by one of said fluids, said second set of folds being open outwardly toward the housing and filled by one of said fluids, with the first and second fluids being on opposite sides of said heat exchanger element and within the folds of the convoluted bellows, with centrifugal force assisting in the circulation of the fluids within the folds due to density differentials provided by heat transfer through the heat conductive heat exchanger members.

4,044,825

HEAT EXCHANGER FOR HIGH TEMPERATURE

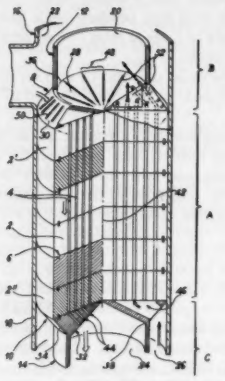
René Gugenberger, Gif-sur-Yvette, and Roger Martin, Paris, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 5, 1976, Ser. No. 646,548

Claims priority, application France, Jan. 6, 1975, 75.00264

Int. Cl.² F28F *9/00*

U.S. Cl. 165—165 **9 Claims**



1. A heat exchanger for the convection of heat between primary and secondary fluids circulating through the exchanger, comprising:

at least one heat exchange block having first and second parallel planar surfaces;

a first end member having a planar surface in sealing contact with said first parallel planar surface of said heat exchange block, and first and second inclined transverse surfaces opposite said planar surface;

a second end member having a planar surface in sealing contact with said second parallel planar surface of said heat exchanging block, and first and second inclined transverse surfaces opposite said planar surface;

means on said first end member separating said first inclined surface from said second inclined surface for forming a primary collecting duct associated with said first inclined surface and for forming a secondary collecting duct associated with said second inclined surface;

means on said second end member separating said first inclined surface from said second inclined surface for forming a primary collecting duct associated with said second inclined surface and for forming a secondary collecting duct associated with said first inclined surface;

first channel means for conducting primary fluid from said primary collecting duct of said first end member through said heat exchange block to said primary collecting duct of said second end member; and

second channel means disposed in a heat convecting relationship with said first channel means and for conducting secondary fluid from said secondary collecting duct of said first end member through said heat exchange block to said secondary collecting duct of said second end member.

4,044,826

RETRIEVABLE WELL PACKERS

Talmadge L. Crowe, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

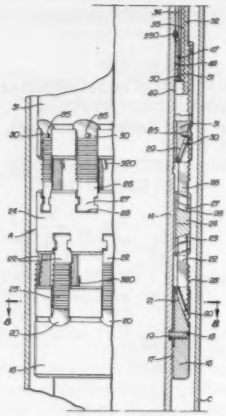
Filed May 17, 1976, Ser. No. 686,886

Int. Cl.² E21B *23/00*

U.S. Cl. 166—120 **43 Claims**

1. A well tool adapted to be lowered in a well conduit disposed in a well bore, comprising body means, expander means on said body means, normally retracted slip means coacting

with said expander means, normally retracted packing means on said body means, actuating means on said body means for effecting relative longitudinal movement between said expander means and slip means to expand said slip means into anchoring engagement with the well conduit, said actuating



means including means movable downwardly of said body means for expanding said packing means against the well conduit, and releasable means for preventing said actuating means from expanding said packing means against the well conduit until said slip means have first been expanded against the well conduit.

4,044,827

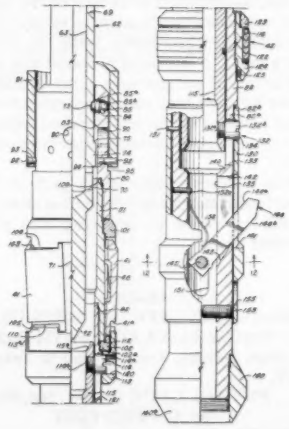
APPARATUS FOR TREATING WELLS

Richard Kerzee, Longview; Robert W. McCollum, Allen, and Carter R. Young, Lewisville, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 460,773, April 15, 1974, Pat. No. 3,957,115. This application Mar. 18, 1976, Ser. No. 668,202

Int. Cl.[2] E21B *33/12*

U.S. Cl. 166—133 **5 Claims**



1. A retrievable well plug for use in temporarily plugging a well bore comprising: a body mandrel having a longitudinal bore therethrough; an annular seal assembly on said body mandrel for sealing around said mandrel with a wall surface along a well bore; radially movable locating and locking keys on said body mandrel for releasably locking said plug at a locking recess along a well bore; retainer means on said body mandrel for restraining said keys inwardly at non-locking positions on said body mandrel; operator finger means on said body mandrel for engaging a coupling recess to activate said key locking means to release said keys for expansion to locking positions on said body mandrel; means for actuating said retainer means to release said keys and for retracting and latching said operator finger means inwardly at an inoperative position responsive to an upward force on said body mandrel; a handling head coupled with said body mandrel for engaging and supporting said plug in a well bore; and valve means connected with said handling head and operable in said bore of said body mandrel to permit fluid bypass through said body mandrel when said plug is lifted in said well bore and to close said bore through said body mandrel when said plug is landed and locked in said well bore.

4,044,828

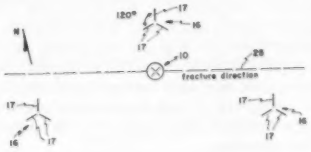
PROCESS FOR DIRECT MEASUREMENT OF THE ORIENTATION OF HYDRAULIC FRACTURES

Arfon Harry Jones; Henri Samuel Swolfs, and Sidney Joseph Green, all of Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Filed July 6, 1976, Ser. No. 703,091

Int. Cl.[2] E21B *47/00, 43/26*

U.S. Cl. 166—250 **4 Claims**



1. A method for directly measuring, from ground stress changes, the orientation of fractures induced into a formation surrounding a well bore comprising the steps of:

packing off, at a desired depth, a portion of a well bore wherein fracturing of the formation surrounding said well bore will be undertaken,

positioning a plurality of stress meters around said well bore, each such stress meter being capable of and arranged to sense ground surface stress changes resultant from fracturing occurring within said well bore said ground surface stress changes being resolvable, as to magnitude and direction, into principal horizontal components of stress change at each stress meter location,

fracturing said material around said well bore by introducing a pressure medium within the packed off area of said well bore, recording, with said stress meters, surface stress changes resultant from fracturing the material around said well bore,

resolving said ground stress changes, as to magnitude and direction, into principal horizontal components of stress change at each stress meter location, and;

determining from said resolved principal horizontal components of stress change the direction of the fracture.

4,044,829

METHOD AND APPARATUS FOR ANNULUS PRESSURE RESPONSIVE CIRCULATION AND TESTER VALVE MANIPULATION

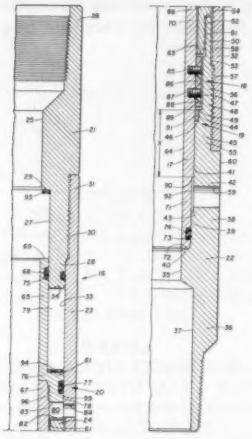
Robert L. Jessup, Duncan, Okla., and Joe E. Coleman, New Orleans, La., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 540,361, Jan. 13, 1975, Pat. No. 3,970,147. This application July 19, 1976, Ser. No. 706,429

The portion of the term of this patent subsequent to July 20, 1993, has been disclaimed.

Int. Cl.[2] E21B *21/00, 23/04, 47/06*

U.S. Cl. 166—264 **7 Claims**



1. In a pipe string located in a fluid filled well bore so as to vertically separate said well bore into an annulus region and an axial bore region, said pipe string including a circulation valve, the method of movement of said circulating valve from a first position preventing to a second position allowing fluid communication between said regions, comprising the steps of:

isolating a negligible pressure gas chamber within said pipe string from said axial bore and said annulus region;

pressurizing one of said regions to a pressure of at least a predetermined magnitude above the pressure in said isolated chamber;

unlocking said circulating valve when the pressure in said pressurized region reaches said predetermined magnitude;

moving said unlocked circulating valve from said first position to said second position in response to the pressure in said pressurized region; and

maintaining said moved valve in said second position.

4. Apparatus for circulation of well fluids in response to pressure in an isolated portion of an annulus between a pipe string and a surrounding well bore, comprising:

a. a hollow cylindrical housing having a recess communicating with the isolated portion of the annulus, an axial interior bore, a passageway communicating the axial interior bore with the annulus, and means for connecting the housing in said pipe string;

b. a valve body carried by said housing and at least partially overlying the recess and movable between a first position closing said passageway and a second position opening said passageway;

c. a first locking means for locking said valve body in said first position to said housing and for releasing said valve body from said housing upon a predetermined force applied to said valve body; and

d. piston means, attached to said valve body, including: seal means for sealingly contacting said recess so as to divide said recess into a negligible pressure compressible chamber isolated from both said axial bore and said annulus, and an annulus pressure chamber isolated from said axial bore but communicating with said isolated portion of said annulus and differential means for applying said predetermined force upon said valve body urging said valve body toward said second position in response to a predetermined higher pressure in said annulus pressure chamber than in said isolated negligible pressure chamber.

4,044,830

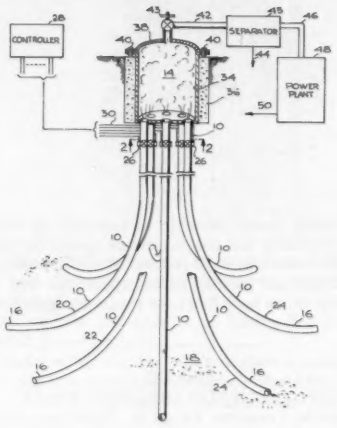
MULTIPLE-COMPLETION GEOTHERMAL ENERGY PRODUCTION SYSTEMS

Allen T. Van Huisen, 29456 Indian Valley Road, Rolling Hills Estates, Calif. 90274

Filed July 2, 1973, Ser. No. 375,751

Int. Cl.[2] E21B *43/14*

U.S. Cl. 166—267 **19 Claims**



1. A system for the recovery of geothermal energy comprising:

a closed, steam vapor collection reservoir vessel for collection of high pressure steam vapor having side walls, a top wall and a bottom wall, said side walls and bottom wall being recessed below the surface of the earth and said bottom wall containing a plurality of apertures;

a plurality of cased geothermal wells, the casings of each having a first end converging toward and sealingly connected to one of the apertures in the bottom wall of said reservoir and each well casing diverging from said reservoir and having a second end disposed within a common, wet geothermal zone having a temperature of at least 300° F; and

vapor fluid delivery means within each of said wells to conduct heated steam vapor fluid from each second end to said reservoir vessel for collecting high pressure steam vapor fluid therein.

4,044,831

SECONDARY RECOVERY PROCESS UTILIZING WATER SATURATED WITH GAS

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,390

Int. Cl.[2] E21B *43/20*

U.S. Cl. 166—275 **14 Claims**

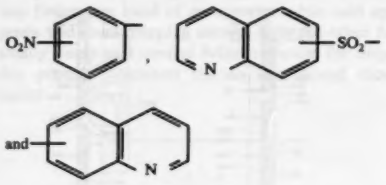
1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injecting well and a production well which comprises:

a. injecting into the formation via an injection well a fluid comprising water saturated at the injection pressure with a gas selected from the groups consisting of natural gas,

carbon dioxide, ammonia, flue gas, and mixtures thereof, and containing a minor amount of a solubilizing agent selected from the group consisting of compounds of the formula:

$$R(OR')_aOH \quad (A)$$

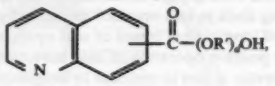
wherein R is selected from the group consisting of:



R' is alkylene of from 2 to 5 carbon atoms and *a* is an integer of from about 5 to about 50,

$$R(OC_3H_6)_b-(OC_2H_4)_c \quad (B)$$

wherein R has the same meaning as previously described, *b* is an integer of from about 3 to about 20, *c* is an integer of from about 10 to about 50 an wherein the sum of *b* plus *c* is not more than about 60, and



(C)

wherein R' has the same meaning as previously described and *d* is an integer of from about 5 to about 50,

b. forcing the said fluid through the formation, and

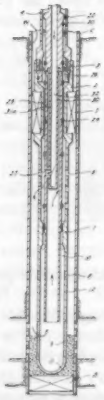
c. recovering hydrocarbons through the production well.

4,044,832

CONCENTRIC GRAVEL PACK WITH CROSSOVER TOOL AND METHOD OF GRAVEL PACKING

Charles A. Richard, Gretna, and John Philip Barbee, Luling, both of La., assignors to Baker International Corporation, Orange, Calif.

Filed Aug. 27, 1976, Ser. No. 718,151
Int. Cl.[2] E21B *33/12, 43/04*
U.S. Cl. 166—278 **15 Claims**



1. An apparatus for use in a subterranean well having a production zone comprising: a packer set in the well above the zone, a tubular liner assembly adapted to depend from the packer within the production zone and to communicate with an outer tubular string sealingly engaged with the packer and extending to the top of the well, said liner assembly including a lower perforated portion through which fluid can flow between the well bore and the interior of the liner assembly and an upper ported portion through which fluid can flow between the well bore and the interior of the upper part of the liner assembly, crossover means positionable within said packer and liner assembly, and adapted for connection to an inner tubular member extending through the outer tubular string to the top of the well, said crossover means having spaced sealing means selectively co-engageable with sealing surfaces within the packer and liner assembly upon movement of said crossover means longitudinally within said packer and liner assembly to prevent flow of fluid between said lower perforated portion and the annular area between said inner tubular member and said outer tubular string, and to selectively form separate fluid passages between said inner tubular member and said upper ported portion, said inner tubular member and said lower perforated portion and between said inner tubular member and said annular area.

8. A method of gravel packing a production zone in a subterranean well comprising the steps of lowering a liner assembly provided with a perforated portion on a packer in the well to locate the perforated portion of said liner assembly within the production zone, setting the packer in the well above the production zone, lowering an outer tubular string into the well and operatively connecting it to the packer, lowering a crossover assembly within the outer string on an inner tubular string to position the crossover assembly within the packer and liner assembly and to provide an annular space between said strings communicable with said perforated portion, said liner assembly having an upper passage above said perforated portion establishing communication between said inner tubular string and the exterior of said liner assembly below said packer, circulating fluid downwardly through said inner string into the region of the well below said packer and surrounding the liner assembly for upward flow through said annular space to the two of the well, and pumping gravel down said inner tubular string into the well surrounding the liner assembly to fill the annular space around the perforated portion of the liner assembly.

4,044,833

ACID FOAM FRACTURING

Herbert A. Volz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 8, 1976, Ser. No. 694,114
Int. Cl.[2] E21B *43/26, 43/27*
U.S. Cl. 166—307 **8 Claims**

1. A method for fracturing subterranean formations comprising the steps of:

a. forming a gelled acid-liquid solution by combining an acid chemically reactive with a subterranean formation with about 250 to about 15,000 ppm of a gelling agent selected from carboxymethylcellulose polymers, polyacrylamides, and polysaccharides,

b. adding a sufficient amount of a surfactant to said gelled acid-liquid solution obtained in (a) to form a stable foam at formation injection conditions, said surfactant being compatible with the other ingredients of the gelled acid-liquid solution and capable of producing foam in an acidic environment,

c. introducing said gelled acid-liquid solution containing surfactant and an inert gas into a subterranean formation under sufficient pressure to form a foam and cause fracturing of said subterranean formation, and

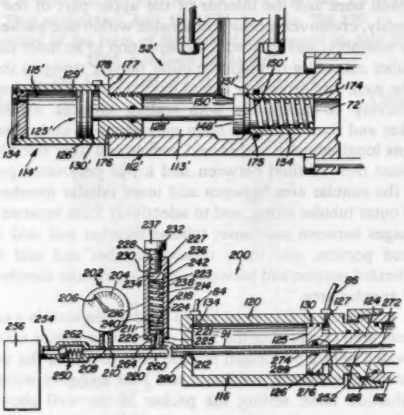
d. allowing the acid contained in said foam to react with the subterranean formation and cause etching thereof.

4,044,834

APPARATUS AND METHOD FOR CONTROLLING THE FLOW OF FLUIDS FROM A WELL BORE

Lee E. Perkins, 127 Malibu Blvd., Houma, La. 70360

Filed Apr. 9, 1975, Ser. No. 566,399
Int. Cl.[2] E21B *43/12*; F16K *31/122*
U.S. Cl. 166—314 **27 Claims**



1. A choke valve for controlling the flow of fluid which comprises means defining a valve chamber having an inlet and an outlet, said outlet defined by an axial bore, a movable bolt-like plug means axially aligned and received within said axial outlet bore to establish at least one helical flow path through said outlet, the relative position of said plug means within said outlet bore controlling the flow of said fluid through said outlet and movement of said plug means within said outlet bore controlled by a hydraulically operated piston means, and surface means associated with said plug means and said piston means which is instantaneously responsive to a change in pressure in said valve chamber to move said plug means within said outlet bore in a direction to dissipate said pressure change.

23. A method of controlling well bore pressure comprising the steps of:

providing a chamber having an inlet and an outlet in the flow path of fluid exiting a well bore;

causing said fluid to flow through an elongated duct in said outlet to control the flow conditions therethrough and the fluid pressure in the chamber and

instantaneously changing the length of said elongated duct in response to changes in the pressure in said chamber in a manner to dissipate said pressure changes and thereby control the pressure in said well bore.

4,044,835

SUBSURFACE WELL APPARATUS HAVING IMPROVED OPERATOR MEANS AND METHOD FOR USING SAME

James D. Mott, Houston, Tex., assignor to Hydril Company

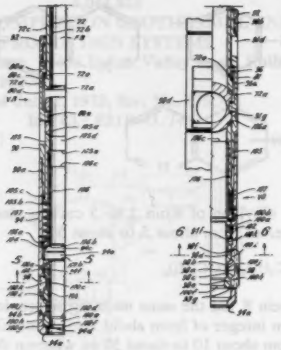
Division of Ser. No. 580,241, May 23, 1975, Pat. No. 4,026,362. This application June 23, 1976, Ser. No. 698,884
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—322 **34 Claims**

1. A subsurface safety valve apparatus adapted for movement through a bore of a well tubing to a desired subsurface location in the well for operably securing in the bore of the well tubing for controlling the flow of fluid in the bore of the well tubing at the subsurface location, including:

frame means movable through the bore of the well tubing to the desired subsurface location for securing and having means for releasably securing with the well tubing at said desired subsurface location;

bore closure means mounted with the frame means for movement to and from open and closed positions for controlling flow of fluid through the bore of the well tubing; and

operator means carried with said frame means for moving said bore closure means to and from the open and closed positions, said operator means having tubular operator assembly movable longitudinally of said frame means for effecting desired operating movement of said bore closure means to and from the open and closed positions, said



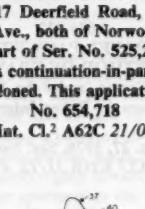
operator assembly having means actuated by initial operation of said bore closure means for eliminating lost motion operating slack in said operator assembly by changing the length of longitudinal travel of said operator assembly to achieve positive operation of said bore closure means by said operator means in response to longitudinal movement of said tubular operator assembly wherein positive operation of said bore closure means is assured.

4,044,836

AXIAL COMPRESSION POWDER DISPENSER

Edward J. Martin, 17 Deerfield Road, and Joseph M. Minkevitch, 26 Folan Ave., both of Norwood, Mass. 02062

Continuation-in-part of Ser. No. 525,226, Nov. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 419,790, Nov. 28, 1973, abandoned. This application Feb. 2, 1976, Ser. No. 654,718
Int. Cl.[2] A62C *21/00*
U.S. Cl. 169—30 **27 Claims**



1. A hand-held and hand-operable powder dispenser, comprising in combination

a. a container having a noncollapsible handle/nozzle section termination at its discharge end in an unobstructed powder dispensing opening of relatively large diameter sized to pass a cloud of dry powder therethrough and at its other end in a cylindrical band member, said handle/section having an internal configuration which permits the free flow of a powder therethrough;

b. a hand gripping section;

c. a central, thin-walled, flexible bellows section joining, through said cylindrical band member, said handle/nozzle section and said hand gripping section, said bellows section having a diameter essentially equal to said band member and being adapted to be collapsed and expanded axially to serve as a pump, the pleats forming said bellows section being joined to form relatively sharp edges; and

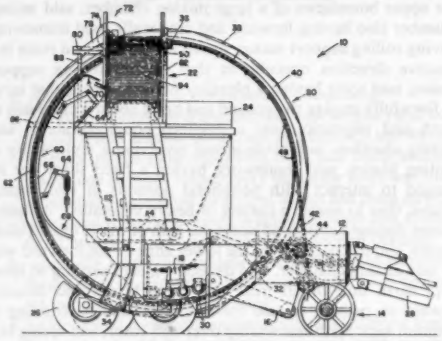
d. readily removable closure/sealing means engageable with said powder dispensing opening; said handle/nozzle section fitting one hand of an operator while said operator graps said hand gripping section with the other hand to axially pump said central bellows section for dispensing dry powder contained therein in repeated cloud-like bursts.

4,044,837

CLEANER FOR ROOT CROP HARVESTER CONVEYOR

Virgil Dean Haverdink, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 1, 1976, Ser. No. 662,581
Int. Cl.² A01D *19/00, 25/00*
U.S. Cl. 171—58 **8 Claims**



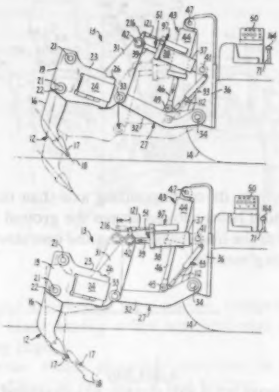
1. A root crop harvester comprising: a mobile frame; root digging means secured across the forward end of the frame; first conveyor means carried by the frame rearwardly of the digging means for receiving roots from the digging means and conveying the same upwardly and rearwardly; second conveyor means carried by the frame for receiving roots from the first conveyor means and moving the same transversely; annular elevator means supported on the frame and disposed for rotation about a horizontal axis, the interior lowermost portion thereof passing in root-receiving relationship to the second conveyor means, said elevator means including a root elevating wheel having a plurality of endless ribs, each rib forming a ring with said rings coaxially disposed in horizontally spaced apart parallel vertical planes, and a plurality of root conveying basket means peripherally spaced and interiorally affixed to said ribs; stripping means for ejecting roots and foreign material from between the rib rings of the annular elevator means including a stripping means support structure carried by the frame and disposed adjacent the upper portion of the root elevating wheel, a shaft carried by the support structure axially parallel with the elevator means axis of rotation, and spaced radially outwardly therefrom, a plurality of stripper wheels rotatably carried by the shaft and disposed to project between the rib rings of the root elevating wheel; and a conveyor means supported on the frame and disposed in underlying and root-receiving relationship to the upper portion of the annular elevator means for receiving elevated roots therefrom and for moving the same transversely to a deposit area.

4,044,838

AUTOMATIC CONTROL FOR RIPPER TOOL

Darrel M. Wooldridge, Oakland, Calif., assignor to American Tractor Equipment Corporation, Oakland, Calif.

Filed Apr. 21, 1975, Ser. No. 570,034
Int. Cl.² A01B *63/111*
U.S. Cl. 172—2 **17 Claims**



16. A tractor mounted ripper tool having,

a. an articulated tool mount for supporting and positioning the ripper tool relative to the tractor,

b. a depth positioning fluid operated cylinder operatively connected to said tool mount and formed for changing the vertical displacement of the ripper tool,

c. a pitch positioning fluid operated cylinder operatively connected to said tool mount and formed for changing the angular displacement of the ripper tool,

d. a fluid power circuit for selectively applying fluid power to the said fluid positioning cylinders and having,

i. a source of fluid power,

ii. first and second fluid conduits and a fluid control valve formed for selectively directing fluid power to either said first fluid conduit or said second fluid conduit,

iii. a diverter valve formed for selectively communicating the first and second conduits to the operative ports of either the depth positioning cylinder or the ports of the pitch positioning cylinder, and

e. control means connected with said diverter valve for positioning said diverter valve and including depth sensor means responsive to the vertical displacement of the ripper tool, said control means operative in response to said depth sensor means to position the diverter valve to direct fluid to the pitch positioning cylinder at a specified vertical displacement.

4,044,839

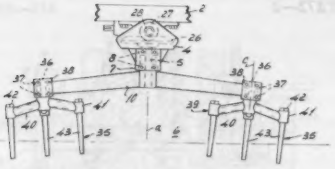
SOIL CULTIVATING MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Sept. 16, 1975, Ser. No. 613,903
Claims priority, application Netherlands, Sept. 18, 1974, 7412331
Int. Cl.² A01B *33/06*
U.S. Cl. 172—49 **14 Claims**

14. A soil cultivating machine comprising a frame and two soil working members rotatably mounted side-by-side on corresponding upwardly extending axes defined by respective shafts on said frame, driving means connected to rotate said shafts in relative opposite directions and said soil working members being positioned to work overlapping strips of soil, each soil working member comprising support means that extends outwardly from its respective shaft, and at least one tool that is freely rotatable about a further upwardly extending

axis defined by a second shaft, said second shaft being journalled on said support means and spaced from said respective shaft, said second shaft extending at an angle to the first mentioned shaft and the upper end of the second shaft being located further from its corresponding axis than the lower end thereof, said tool being moved across the ground in a circular path inclined to the horizontal during the operative rotation of the soil working member.



4,044,840

SOIL CULTIVATING MACHINES

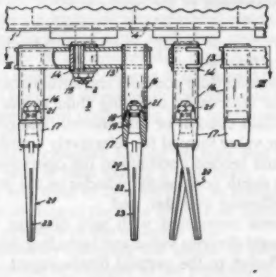
Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Filed Nov. 17, 1975, Ser. No. 632,688

Claims priority, application Netherlands, Nov. 21, 1974, 7415161

Int. Cl.² A01B *33/00, 23/00*

U.S. Cl. 172—59 **13 Claims**



1. A soil cultivating machine comprising a frame and a plurality of soil working members rotatably mounted on upwardly extending shafts that are positioned in a row extending transverse to the direction of travel of said machine, and driving means connected to rotate said shafts, each soil working member comprising a substantially horizontal support at the lower end of a corresponding upwardly extending shaft and at least one elongated, downwardly extending arm depending from said support, said arm being spaced from said shaft and extending downwardly in a direction substantially parallel to that of said shaft, the lower end of said arm comprising a sleeve-like holder and a tine secured in said holder, said tine having a lower active portion and an upper fastening portion, said fastening portion being secured in said holder by fastening means and said active portion extending downwardly below the holder, said fastening means being located within said arm, and the upper end of said fastening portion terminating adjacent the lower end of said arm, said support being normally positioned substantially above the soil being worked by the active tine portion to avoid impact damage from debris in and on the ground.

4,044,841

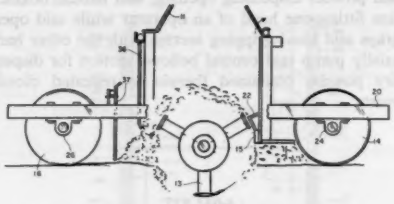
ROTARY TILLER DEVICE ADAPTED FOR CHOPPING

Alexander Smith, and Burton D. Baggs, Jr., both of Sanford, Fla., assignors to Smitty's Incorporated, Sanford, Fla.

Continuation-in-part of Ser. No. 319,039, Dec. 27, 1972, Pat. No. 3,892,278. This application June 27, 1975, Ser. No. 591,098

Int. Cl.² A01B *33/02, 33/12*

U.S. Cl. 172—72 **32 Claims**



11. A tiller for cutting and mulching vegetation, comprising a framework, an elongate, ground-engaging rotor mounted for rotation with respect to said framework, and a cooperative cover essentially surrounding the upper portion of said rotor but spaced above said rotor for a substantial distance to define the upper boundaries of a large mixing chamber, said mixing chamber also having forward and rear walls, said framework having rolling support means, means for driving said rotor in a rotative direction opposite to that of said rolling support means, said rotor having a plurality of blade means that serve to forcefully engage the ground and bring about a cross-mix of earth and vegetation into a fluidized conglomerate in said mixing chamber, said blade means involving a multiplicity of cutting blades, said framework having a fixed shear bar arranged to interact with peripheral portions of said cutting blades, thus to enable a cutting of heavy vegetation, deflector means disposed closely adjacent the path of travel of said blade means, and disposed above the lower edge of the forward wall of said mixing chamber, said deflector means serving to intercept earth thrown off from said rotor blades and directed toward or parallel to said forward wall, and functioning to redirect such earth rearwardly over said rotor, and spring bias means for biasing said rotor in such a way that its blades normally operate in close proximity to said shear bar, though not in metallic contact therewith, such bias means being at least partially overcome in the event a hard obstruction wedges between said shear bar and said blades, thus allowing an increase in the shear bar-blade spacing, such that the obstruction may pass through.

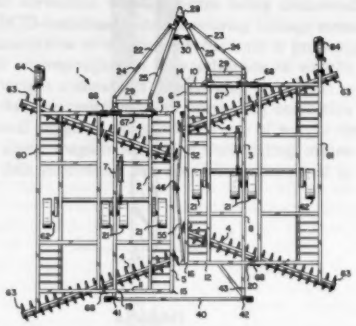
12. A tiller for cutting and mulching vegetation comprising a framework, an elongate, ground-engaging rotor mounted for rotation with respect to said framework, and a cooperative cover essentially surrounding the upper portion of said rotor but spaced above the rotor for a substantial distance to define a large mixing chamber, said tiller having rolling support means, means for driving said rotor in a rotative direction opposite to that of said rolling support means, said rotor having a plurality of blade means that serve to forcefully engage the ground and bring about a cross-mix of earth and vegetation into a fluidized conglomerate in said mixing chamber, with the action of said rotor causing the fluidized mixture of earth and vegetation to flow over said rotor and thence downwardly behind said rotor, upper and lower hinged skirts, said upper skirt forming at least a portion of the rear wall of said mixing chamber, with the position of said upper skirt being responsive to at least some degree to the rate of flow of the fluidized conglomerate flowing through said mixing chamber, said lower skirt having a lower edge generally in contact with the tilled earth, and arranged to level the fluidized mixture after it has been deposited on the ground, and means for accomplishing a ready adjustment of the position of said rotor with respect to said framework.

4,044,842

FLEXIBLE MULTI-SECTION IMPLEMENT

Richard A. Worick, Beloit, Kans., assignor to Charles W. Fleming; Gerald H. Meier; Milton Rasdall, all of Beloit and William Laas, Salina, all of Kans.

Filed July 11, 1975, Ser. No. 594,968
Int. Cl.[2] A01B 5/04
U.S. Cl. 172—314 9 Claims



1. An implement frame construction comprising:

a. left rigid horizontal frame section and a right rigid horizontal frame section positioned in generally side-by-side relation, tillage tools depending from said frame sections, said frame sections respectively including inner and outer elongated longitudinal structural beams and front and rear elongated transverse beams welded together and forming front and rear inner and outer frame section corners;

b. vertically adjustable wheels mounted on said respective frame sections and supporting same for forward horizontal movement along the ground;

c. an elongated forwardly and inwardly angled draw tongue for each of said frame sections, pivotal joint members connecting the rear ends of said draw tongues to said respective front transverse beams and permitting said draw tongues to pivot vertically, a tractor hitch clevis flexibly connected to the front ends of said draw tongues and forming a common generally central draw point for said frame sections;

d. a front transverse spacer link having ball joints at opposite ends, said last named ball joints being connected respectively to said draw tongues intermediate said tongue ends, an elongated rear transverse stabilizing bar having opposite ends and extending generally parallel to said rear transverse beams, said rear bar ends being vertically pivotally connected to said frame sections near said respective rear outer corners;

e. a gag link having an upper end and a lower end and a central mount therebetween, said gag link being positioned generally between said frame sections and pivotally engaged at said central mount with one of said inner beams intermediate said front and rear inner corners, a first gag having a forward end pivotally connected to the other of said inner beams near said front inner corner, said first gag bar having a rear end pivotally connected to one of said gag link ends, a second gag bar having a rear end pivotally connected to said other inner beam near said rear inner corner, said second gag bar having a front end pivotally connected to the other of said gag link ends;

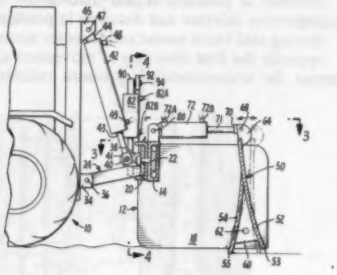
f. whereby said frame sections are permitted to universally flex with respect to each other without substantial variation in lateral spacing therebetween.

4,044,843

TRACTOR-MOUNTED SCRAPER

Arnold Emeral Holub, 1611 Ayers Road, Concord, Calif. 94521

Filed Apr. 22, 1976, Ser. No. 679,217
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—802 3 Claims



1. A scraper attachment for a tractor, comprising:

a scraper blade having a first scraping edge and a second scraping edge;

blade carrier means pivotably mounted on carrier pivot means affixed to one end of said tractor;

blade pivot means for pivotably mounting said blade in said blade carrier means, the location of said blade pivot means in said blade carrier means and the range of pivotal positions of said blade being such that either one of said scraping edges can be selectively positioned below the other and below the lower edge of said blade carrier means; and

power-operated blade carrier positioning means for

a. raising said blade carrier means and thus raising said blade out of contact with the ground when in a first, powered mode of operation,

b. pivoting said blade carrier means downwardly about said carrier pivot means so that one end of said tractor is supported solely by said blade when in a second, powered mode of operation, and,

c. permitting said blade to rest upon the ground, bearing the weight of said blade carrier means but not bearing the weight of said tractor, when in a third, unpowered mode of operation;

said blade carrier means comprising a pair of planar side members the lower edges of which constitute said lower edges of said blade carrier means, said blade being located between said planar side members, and said blade pivot means being located near the lower edges of said side members and near the edges of said side members remote from said tractor.

4,044,844

IMPACT DRILLING TOOL

Jesse W. Harris; Ross Bassinger, and Grey Bassinger, all of San Antonio, Tex., assignors to Bassinger Tool Enterprises, Ltd., San Antonio, Tex.

Continuation-in-part of Ser. No. 479,369, June 14, 1974, Pat. No. 3,970,152. This application July 19, 1976, Ser. No. 706,678
Int. Cl.[2] E21B 1/06
U.S. Cl. 173—73 10 Claims

1. A fluid actuated impact drilling tool for use in rotary drilling in a string of drilling pipe comprising:

housing means;

means for connecting said housing means to said string of drilling pipe;

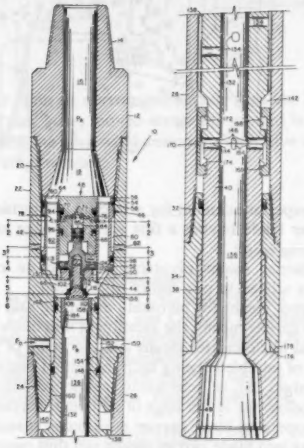
flow means through said housing means for allowing a fluid to flow therethrough;

valve means slidably mounted in said flow means of said housing means;

hammer means slidably mounted in said flow means of said housing means, said valve means and said hammer means

moving independently of and relative to each other for periodically interrupting substantial flow of said fluid in said flow means by a first movement along an axis of said drilling tool when said valve means and said hammer means reach a predetermined plane perpendicular to said axis, said interruption of flow of said fluid causing an increase in pressure of said fluid above said plane and a decrease in pressure of said fluid below said plane, said respective increase and decrease in pressures of said fluid driving said valve means and hammer means in a direction opposite the first direction of movement along said axis;

means for communicating pressure outside said housing



means to said valve means and said hammer means, said outside pressure being less than pressure of said fluid received by said flow means thereby giving a pressure differential, said first movement of said valve means and said hammer means being caused by said pressure differential acting on given surfaces of said valve means and hammer means as defined by seal means, movement in said opposite direction being caused by said increase and decrease in pressures above and below said plane, respectively, acting on said surfaces;

said movement of said valve means between predetermined stops, said valve means having dampening means for preventing impact damage to said valving means.

4,044,845

DRILLING TOOL WITH A TWO PART INPUT UNIT

Gerhard Rumpp, Inning; Wilm Krüger, Puchheim, and Dieter Scholz, Unterpfaffenhofen, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 27, 1976, Ser. No. 662,234

Claims priority, application Germany, Mar. 3, 1975, 2509141

Int. Cl.[2] E21C *13/00*

U.S. Cl. 175—409 **20 Claims**

1. A drilling tool arranged to be inserted into a drilling machine for use in boring holes and the like where rotational movement developed in the drilling machine is transferred to the drilling tool, said drilling tool comprising a drilling member and an input unit, said drilling member comprises an axially elongated shank having a forward end shaped to effect boring action and a rearward end, said input unit being formed at least in part of material having a different and lower thermal conductivity than the material forming said drilling member and laterally enclosing at least an axially extending portion of said rearward end, said input unit having an outer surface spaced radially outwardly from and extending circumferentially about the rearward end of said shank and arranged to fit into and to transmit the rotational movement of the drilling machine to said drilling member, said input unit being formed of at least a first material and a second material with said first material having a higher thermal conductivity than said second material and forming at least part of the outer surface of said input unit, said second material having the different and lower thermal conductivity than the material forming said drilling member, wherein the improvement comprises a heat conducting bridge extending between the outer surface of said input unit and said shank, said heat conducting bridge being formed of said first

material, said heat conducting bridge being capable of transmitting heat radially outwardly from said shank of said drilling member and said second material being of a softer material than the material of said drilling member and being in contact with said heat conducting bridge and filling said input unit between the outer surface thereof and said shank so that the combination of said first and second materials affords sufficient strength to said input part to transmit the rotational movement of the drilling machine to said shank.

4,044,846

AUTOMATIC ZEROING OF SCALES WITH DIGITAL DISPLAY

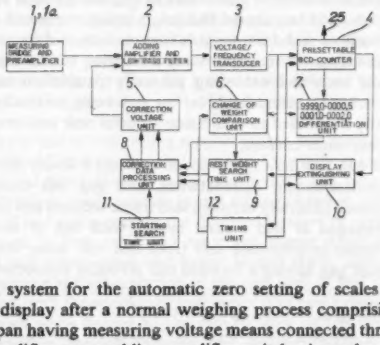
Waltteri Matilainen, Hiirakkotie 3 E 86, 01200 Hakunila, Finland

Filed Mar. 2, 1976, Ser. No. 663,125

Claims priority, application Finland, Mar. 7, 1975, 664/75

Int. Cl.[2] G01G *13/14, 3/14, 19/40*

U.S. Cl. 177—165 **8 Claims**



1. A system for the automatic zero setting of scales with digital display after a normal weighing process comprising: a goods pan having measuring voltage means connected through a preamplifier to an adding amplifier unit having a low-pass filter; said amplifier unit with the low-pass filter being connected to a frequency and voltage transducer unit which is connected to a presettable BCD-counter and to a change of weight comparison means; said presettable BCD-counter being connected to a memory store which is connected to a calcula-

tor; the calculator being connected through a display drive to a display; a timer unit being connected to said BCD-counter, to said change of weight comparison means, to said memory store, to said calculator, and to said display drive; said BCD-counter being connected to a differentiating means for detecting deviations of a count value of the BCD-counter within given limits in one direction or the other from a count value producing zero indication, the differentiating means supplying a correction order and direction of correction to a correction data processing unit which is connected to a correction voltage means; said correction voltage means being connected between the BCD-counter and said measuring voltage means for causing a correction of the count value until it produces the count value corresponding to zero indication of weight; said change of weight comparison means being connected to said correction data processing unit for preventing correction during the normal weighing process when rate of weight change exceeds a given magnitude; said differentiating means and correction data processing unit also being connected to said timer unit.

4,044,847

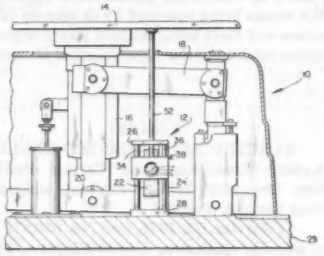
WEIGHING SYSTEM WITH A MOIRE OPTOELECTRONIC TRANSDUCER

Bosco Wu, Trumbull, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 30, 1976, Ser. No. 653,850

Int. Cl.² G01G *3/00, 23/36*

U.S. Cl. 177—210 R **9 Claims**



1. A weighing scale having a frame, a displaceable tare structure carried by said frame, said tare structure being yieldably displaceable in accordance with the mass of a load being weighed, and an optical detector system for determining the extent of tare structure displacement: said optical detector system comprising

means for providing a light beam;

a pair of grating sets, each of said grating sets having an optical grating, one of said grating sets being mounted on said frame, and the other of said grating sets being mounted so as to move with said tare structure and relative to said one of said grating sets;

said pair of optical grating sets being mutually angularly oriented so that said two optical gratings are positioned at an angle with respect to one another and modulate said light beam so as to generate a pattern of moire optical interference fringe lines, movement of the grating set that moves with said tare structure causing transverse movement of said fringe lines; and

photodetector means adapted to be aligned with said transverse fringe movement for detecting movement of said fringe lines produced by the displacement of said tare structure.

4,044,848

FLOOR TREATING MACHINES

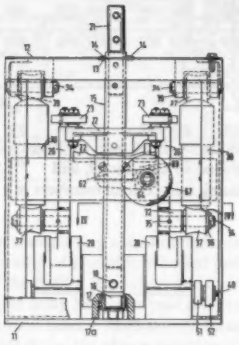
John Thomas Wilkins, Bushey Heath, England, assignor to R. G. Dixon & Company Limited, Wembley, England

Filed Jan. 28, 1976, Ser. No. 652,988

Claims priority, application United Kingdom, Jan. 30, 1975, 4158/75

Int. Cl.² B62D *11/02*

U.S. Cl. 180—6.5 **7 Claims**



1. In a floor treating machine comprising a pair of driving wheels with independent speed control, a control tube mounted in a swivel joint to move differentially, a pair of independently movable manually operable control members mounted to move on parallel axes side by side on the machine, a cross member on the control tube and links connecting the said cross member to the control members with each of such control members being operably connected to an individual electrical component forming part of the speed control for one of the driving wheels, guide means to restrict the said control elements to fore and aft movement in relation to the machine, whereby synchronized movement of the control members provides equal adjustment of the wheel speeds, whereas differential movement of the control members provides a steering effect: the improvement of at least one damping device associated with each of the electrical control components to reduce the sensitivity thereof to fluctuating forces applied by an operator and a switch operating means mounted on at least one control member.

4,044,849

STEERING CONTROL APPARATUS FOR USE IN ENDLESS TRACK TYPE TRACTORS AND CONTROL VALVE FOR USE THEREWITH

Kazutoshi Imon, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 28, 1976, Ser. No. 652,994

Claims priority, application Japan, Aug. 20, 1975, 50-100089

Int. Cl.² B62D *11/00*

U.S. Cl. 180—6.7 **11 Claims**

1. A steering control apparatus for an endless track type tractor comprising a pair of control members,

a barrel rotatably mounted on a stationary shaft, said control members being fixedly secured to said barrel,

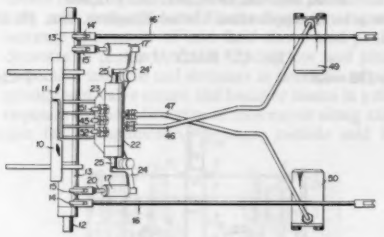
a pair of valve connecting levers fixedly secured to said barrel on a first side thereof,

a driving rod connected to a second side of each said valve connecting levers,

a spring means connecting each said driving rod to a crank means,

valve means for steering control clutch for releasing said clutch when actuated, said valve means having stem members mounted at both ends thereof, said stem members being connected to each of said crank means,

a pair of clutch yokes for releasing clutches when actuated, said clutch yokes being connected to said valve means, wherein said valve means is of a mono-spool type,



a pair of brakes, with a pair of brake connecting levers fixedly secured to said barrel, and

means for biasing said control members in a clockwise direction.

4,044,850

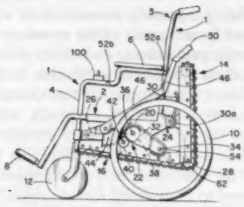
WHEELCHAIR

Malcolm C. Winsor, Pond Road, Mont Vernon, N.H. 03057

Filed Apr. 14, 1975, Ser. No. 567,547

Int. Cl.² B62D *55/04*

U.S. Cl. 180—9.2 C **23 Claims**



1. A wheelchair comprising,

a. a seat frame for carrying an operator or a load,

b. large diameter ground contacting wheels on each side of the frame,

c. a hub for each of said wheels, said hubs defining wheel axle which are parallel,

d. for each wheel, a wheel arm carrying at one end thereof the wheel hub and pivotally connected at the other end to the frame,

e. whereby rotation of the wheel arm in one direction raises the wheel and rotation in the opposite direction lowers the wheel to contact the ground and support the wheelchair,

f. means for rotating the wheel arm including a manually operated lever pivotally attached to the frame and

g. a drive connection between the lever and the wheel arm,

h. whereby rotation of the lever rotates the wheel arm raising the wheel,

i. a traction device carried by the frame and oriented to propel the wheelchair in the same direction as the wheels,

j. traction device positioning means for positioning the traction device in a retracted position and in at least one position for propelling the wheelchair when the large diameter wheels are raised and

k. means for driving the tractor device to propel the wheelchair.

4,044,851

CYCLE PROPELLED BY MOTOR AND PEDALS

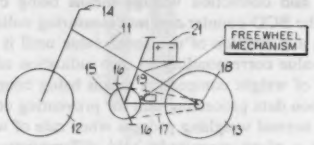
Leslie Thomas Shaw, Birmingham, and Charles Patrick Duncan Davidson, Droitwich, both of England, assignors to Lucas Industries Limited, England

Filed Jan. 21, 1976, Ser. No. 650,871

Claims priority, application United Kingdom, Jan. 21, 1975, 2629/75

Int. Cl.² B62D *3/00*

U.S. Cl. 180—33 C **2 Claims**



1. An electrically assisted cycle including a frame, a ground engaging wheel rotatably mounted on the frame, a rotatable drive member rotatably mounted on the frame, rider operable pedals coupled to the drive member whereby the rider can apply driving force, an endless, non-extensible flexible member coupling said drive member and said wheel whereby rotation of said drive member propels said cycle, an electric motor and an associated power source carried by said frame, the output of said motor being coupled to said wheel whereby said motor can apply driving force to said wheel, and an electrical switch means operable by the application to said pedals by the rider of driving force to propel the cycle, said switch being so associated with said motor that the motor cannot be energized unless said switch means is operated, wherein there is a degree of lost motion between the pedals and the drive member which must be taken up before the pedals drive the drive member, said switch means being operated by th take-up of said degree of lost motion and there being resilient means urging the pedals in a direction relative to the drive member to restore said lost motion.

4,044,852

ELECTRICALLY ASSISTED CYCLE

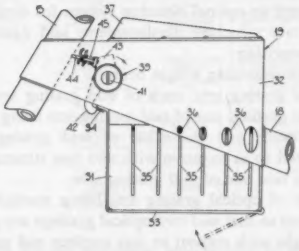
Frank Lewis, Birmingham, and Charles Patrick Duncan Davidson, Droitwich, both of England, assignors to Lucas Industries Limited, England

Filed Jan. 21, 1976, Ser. No. 650,876

Claims priority, application United Kingdom, Jan. 21, 1975, 2634/75; Feb. 7, 1975, 5262/75

Int. Cl.² B62D *25/00*

U.S. Cl. 180—68.5 **18 Claims**



1. An electrically assisted cycle including a frame, a ground engaging wheel, means rotatably mounting the ground engaging wheel on the frame, a rotatable drive member, means rotatably mounting the drive member on the frame, means whereby a rider of the cycle can rotate said rotatable drive member relative to the frame, an endless non-extensible flexible member coupling the drive member and the wheel whereby

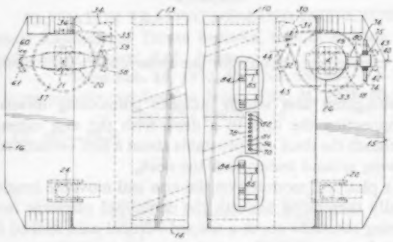
rotation of the drive member propels the cycle, an electric motor, means mounting the electric motor on the frame, a battery support including a box-like member secured to or incorporated in the frame, the box-like member being open at one face and receiving therein an electric storage battery, the battery support further including a releasable retaining member carried by the box-like member to retain the battery therein in use, said electric motor having an output member coupled to said ground engaging wheel whereby the motor can propel the cycle, means electrically connected said electric storage battery to said electric motor said means incorporating a first electrical switch whereby the electrical circuit between the motor and the battery can be made and broken, and, a key operated mechanism incorporating first locking means associated with said battery retaining member whereby said retaining member can be locked in said operative position so that the appropriate key is required to release the retaining member to remove the battery, and said key operated mechanism further including a latch bolt arranged to lock a movable part of the cycle against movement so as to inhibit unauthorised use of the cycle, said latch bolt being movable by operation of the appropriate key in said key operated mechanism.

4,044,853

DRIVERLESS VEHICLE AND GUIDANCE SYSTEM

George A. Melke, Charlevoix, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Apr. 5, 1976, Ser. No. 674,052
Int. Cl.[2] B60K *26/00*
U.S. Cl. 180—98 11 Claims



1. A driverless vehicle movable along a guide path provided on a surface over which the vehicle travels;

said vehicle including a frame having a front end and a rear end;

wheel means for supporting the frame including a front steerable wheel mounted for steering movement about a steering axis located adjacent to the front end of the frame, a rear steerable wheel mounted for steering movement about a steering axis located adjacent to the rear end of the frame, each of said steerable wheels having a steering motor arranged to move such steerable wheel about the steering axis thereof;

a guidance system for independently regulating the operation of the steering motor for each of the steerable wheels, said guidance system including for each steerable wheel a direction sensing unit adapted to produce steering signal from the guide path, and separate circuit means for regulating the operation of each steering motor in response to said steering signals whereby each of the steerable wheels is independently controlled to follow the guide path; and,

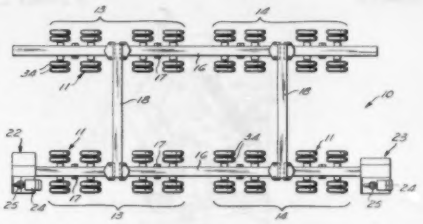
drive means operably connected to one or more of said steerable wheels for propelling the vehicle.

4,044,854

POWER STEERING SYSTEM FOR HEAVY LOAD DOLLIES

Marvin G. Schmitt, Fountain Valley, Calif., assignor to AMI Industries, Inc., Downey, Calif.

Filed May 14, 1976, Ser. No. 686,492
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—140 10 Claims



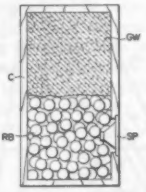
1. A system for transporting a load of high mass and/or bulk comprising a plurality of steerable wheeled dollies, means for locating each of the dollies relative to one another and to the load, each steerable dolly having at least one castered wheel, a source of pressurized fluid, a fluid power actuator associated with each steerable dolly, the power actuator of each steerable dolly being operably connected to its associated castered wheel to forcibly steer the wheel angularly to the left or right in response to changes in fluid volume in the actuator, control means for directing fluid from the source to the actuators and for exhausting fluid pressure from the actuators to thereby operate the actuators and determine the steering position of the castered wheels, at least two of said actuators being coupled by a common fluid pressure in a parallel branch circuit fluid connection to said control means whereby steering reaction forces on the associated wheels are employed to synchronize the angular steering displacement of the associated wheels by balancing of the common fluid pressure in the coupled actuators.

4,044,855

LOUDSPEAKER DEVICE

Fumio Kobayashi, Hino, Japan, assignor to Sansui Electric Co., Inc., Tokyo, Japan

Filed Oct. 30, 1975, Ser. No. 627,335
Claims priority, application Japan, Nov. 1, 1974, 49-126290
Int. Cl.[2] H05K *5/00*
U.S. Cl. 181—151 11 Claims



8. A loudspeaker device having a speaker cabinet with spaced front and rear faces defining a depth, each face having a length and a width, and a speaker unit mounted in said front face,

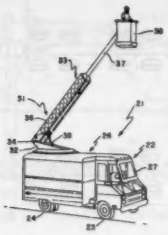
said speaker cabinet having at least one first inner region filled with a first filler material formed of a flexible, gas-bearing material and at least one second inner region adjacent to said first inner region and filled with a second filler material made of a fibrous cotton-like material.

4,044,856

LIFTING EQUIPMENT HAVING A BOOM STRUCTURE AND A CONTROL MECHANISM FOR USE THEREWITH USING A FLEXIBLE LIGHT GUIDE

Robert E. Stevenson, Redwood City, Calif., assignor to General Cable Corporation, San Carlos, Calif.

Filed July 25, 1975, Ser. No. 598,743
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 **12 Claims**



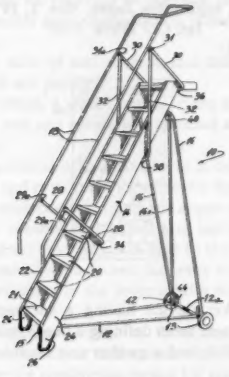
1. In a lifting equipment, a support structure, a boom structure movably mounted on said support structure, a workman's platform carried by the boom structure, the boom structure including means for electrically insulating the workman's platform from the support structure, a source of light electrically insulated from said workman's platform, a control mechanism accessible from the workman's platform, means for supplying light from said source to said control mechanism, at least one flexible light guide means carried by the boom structure and coupled to the control mechanism, said control mechanism having control means whereby upon operation of said control means light from the source can be selectively introduced into said flexible light guide means, photosensitive means for sensing when light is introduced into said light guide means and motive means connected to said photosensitive means for operating the lifting equipment whereby the outer end of the boom structure and the workman's platform can be moved relative to the support structure.

4,044,857

MOBILE LADDER

Marcel Guerette, Lachenaie, Canada, assignor to Moody Si Ltd., Terrebonne, Canada

Filed May 17, 1976, Ser. No. 686,736
Int. Cl.[2] E06C *5/04*
U.S. Cl. 182—17 **7 Claims**



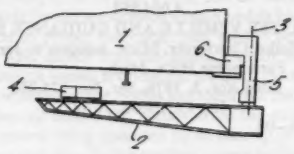
1. A mobile ladder comprising a base, castors mounted to the base adapted to provide mobility thereto, a ladder connected to the base, a support member connected at one end to the base at a point spaced from the ladder connection with the base, and the other end of the support member being hingedly connected to the ladder at a point spaced from the ladder and base connection, forming a structural triangle therewith; the ladder including a floor engaging member fixed thereto and adapted to engage the floor, the connection of said ladder to said base including a link member pivotally mounted to the base about a first axis normal to the plane through the structural triangle, said link being pivotally connected to the ladder about a pivot having an axis parrallel to the first axis and spaced therefrom, the link being adapted to pivot about the first axis such that said ladder pivot follows an arc between a first position whereby the floor engagement member of the ladder is in frictional contact with the floor surface and a second position whereby the ladder pivot with the link is passed over the gravitational dead center position above the first axis, and whereby said floor engaging member of said ladder is spaced from the floor surface.

4,044,858

MAINTENANCE DEVICE FOR USE UNDERNEATH DECK STRUCTURES

Lauritz Vikre, Bergen, Norway, assignor to Sverre Munck A/S, Bergen, Norway

Filed Nov. 21, 1975, Ser. No. 634,117
Claims priority, application Norway, Nov. 22, 1974, 744217; Nov. 17, 1975, 753855
Int. Cl.[2] E04G *3/10, 3/14*
U.S. Cl. 182—82 **15 Claims**



1. A maintenance device for use underneath a deck comprising:

an elongated arm which includes connecting means for connecting the arm to a deck with the arm extending beneath the deck and pivotable about a first vertical axis to swing around underneath the deck,

and a platform mounted on the arm and movable longitudinally therealong beneath the deck, said platform further being rotatable about a second vertical axis, spaced from the first vertical axis, relative to said arm.

4,044,859

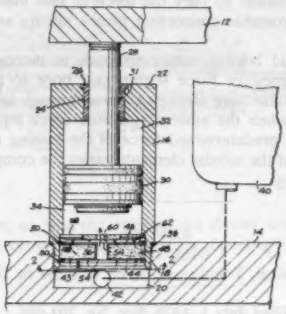
LUBRICATING MEANS FOR GAS-OPERATED CYLINDERS

Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124

Filed Sept. 13, 1976, Ser. No. 722,862
Int. Cl.[2] F16N *1/00, 23/00*
U.S. Cl. 184—18 **15 Claims**

1. In combination, a cylinder, a piston in said cylinder dividing it into a working chamber adjacent the head end of the cylinder and an idle chamber adjacent the rod end of the cylinder which vary inversely in size in response to reciprocation of the piston in the cylinder, said piston having a rod extending axially through said idler chamber and outwardly beyond the rod end of the cylinder for connection with a force-applying means for displacing the piston in a direction toward the head end of the cylinder, port means adjacent the head end of the cylinder for introducing gas under pressure to said working chamber for displacing the piston in a direction toward the rod end of the cylinder, means defining a lubricant chamber interposed between said port means and said working

chamber and through which the gas from said port means is directed to said working chamber, an air-permeable, lubricant-impregnated material in said lubricant chamber, said lubricant chamber having a wall provided with a plurality of apertures through which said gas is adapted to flow from said lubricant



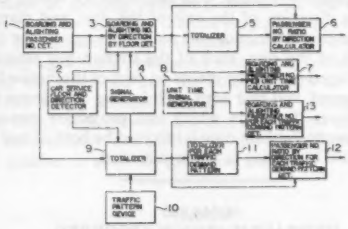
chamber to the working chamber, a valve plate cooperating with said apertured wall for blocking said apertures when the gas pressure in the working chamber is equal to or exceeds the pressure at said port means and means for causing the gas to bypass said lubricant chamber when the gas flow is from the working chamber toward said port means.

4,044,860

ELEVATOR TRAFFIC DEMAND DETECTOR

Takashi Kaneko, and Tatsuo Iwasaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 18, 1976, Ser. No. 658,894
Claims priority, application Japan, Feb. 21, 1975, 50-20948
Int. Cl.² B66B *1/18*
U.S. Cl. 187—29 R **12 Claims**



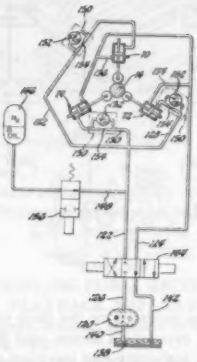
1. An elevator car traffic demand detecting apparatus for a plurality of elevator cars serving a plurality of floors, comprising a first device for detecting the number of passengers boarding and alighting from each car each time the car serves each floor, a second device for detecting the floors served by the car, a third device for detecting the direction of travel of the car service, a fourth device supplied with at least the three outputs respectively from said first, second and third devices for detecting the number of boarding and alighting passengers by direction for each floor each time the car serves each floor, and a fifth device for accumulating, by floor and by direction, the numbers of boarding and alighting passengers by direction for each floor which are detected by said fourth device each time the car served each floor.

4,044,861

SUPPORT DEVICE FOR ROTATING BAR INCLUDING AN ASSEMBLY FOR CUSHIONING AND DAMPENING VIBRATORY MOVEMENT OF THE BAR

Abdulhadi K. Abu-Akeel, and Gerald C. Rieck, both of Sterling Heights, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1976, Ser. No. 734,366
Int. Cl.² F16D *63/00*
U.S. Cl. 188—1 B **2 Claims**



1. A support device for dampening the vibrational movement of an elongated rotating cylindrical bar, said support device comprising a base member supporting at least three hydraulic cylinders with the longitudinal center axis of each hydraulic cylinder being angularly spaced from the longitudinal center axis of the adjacent hydraulic cylinder by equal amounts and adapted to pass through the center of the bar, each of said hydraulic cylinders having an inner end located adjacent said center of the bar and an outer end, a piston member reciprocably mounted in each hydraulic cylinder having connecting rods extending from the inner and outer ends thereof and being sized so that the corresponding pressure responsive areas of said piston member on which fluid pressure acts to move said piston member in corresponding directions is equal for all hydraulic cylinders, a roller connected to the connecting rod of the piston members in each of said hydraulic cylinders adjacent the inner end thereof, spring means connected to the connecting rod of the piston member of each of said hydraulic cylinders adjacent the outer end thereof for counterbalancing the inertia of the roller and the piston member, a hydraulic circuit having a pump for selectively directing pressurized hydraulic fluid to the chambers at the outer and inner ends of each of said hydraulic cylinders for adjusting the position of the roller relative to the outer periphery of said bar, said hydraulic circuit including an accumulator, conduit means for fluidly connecting the outer ends of the three hydraulic cylinders to said accumulator, and a flow control valve located in said conduit means between each hydraulic cylinder and the accumulator for dampening vibratory movement of the bar during high speed rotation thereof.

4,044,862

VEHICLE SUCTION BRAKE

Sundar Savarimuthu, 17 Gleneagle Crescent, Willowdale, Ontario, Canada

Filed Aug. 24, 1976, Ser. No. 716,998
Int. Cl.² B60T *1/14*
U.S. Cl. 188—5 **5 Claims**

1. An auxiliary brake for a motor vehicle driven upon a roadway comprising:

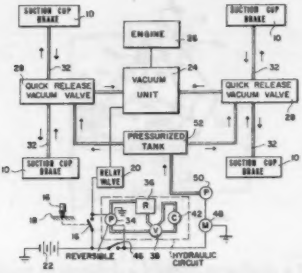
at least one suction cup normally stored on said vehicle;

means on said vehicle for lowering and raising said suction cup, said raising and lowering means including a fluid

cylinder having a piston connected to said suction cup and a fluid circuit for driving said piston in said cylinder, said fluid circuit being selectively actuable;

means on said vehicle for evacuating air from the interior of said suction cup thereby creating a vacuum between said suction cup and said roadway;

means on said vehicle for supplying air to said interior of said suction cup to break the vacuum between said suction cup and said roadway;



first switch means mounted on the floor of said vehicle for activating said evacuation means, said first switch means simultaneously activating said lowering and raising means to lower said piston; and

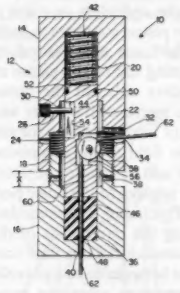
second switch mounted on the dash of said vehicle for simultaneously actuating said supply means and for deactivating said raising and lowering means to raise said piston.

4,044,863

CABLE BRAKE AND LOCK

Harold P. Feldman, Frederick, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,894
Int. Cl.[2] B65H *59/10*
U.S. Cl. 188—65.1 **14 Claims**



1. A control device to automatically regulate the deployment of a flexible connecting element passing through the device in response to ambient pressure which comprises:

a housing having a central, longitudinal bore in a fluid communication with the ambient environment;

a resilient element positioned within said bore and having a passage for the flexible connecting element;

a biasing means for applying a selectable, predetermined force to said resilient element and responsive to pressure increase in said bore to reduce the force on said resilient element;

means to vary the force of said biasing means;

said biasing means comprising a force transmitting member reciprocally positioned within said bore having one end in abutting contact with said resilient element;

a spring in said central bore and in biasing contact with the remaining end of said force transmitting member; and

wherein

two interconnected tubular elements comprise said housing and said means to vary the force of said biasing means includes roatable connecting means joining said tubular elements,

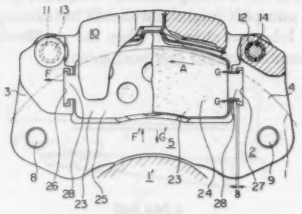
whereby said biasing means responds to increases in the ambient pressure force within said bore to permit the flexible connecting element to pass through said resilient element when the ambient pressure force equals to exceeds the predetermined force of the biasing means and rotation of the tubular elements varies the compression of said spring.

4,044,864

DISC BRAKE

Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed July 1, 1976, Ser. No. 701,606
Claims priority, application Japan, July 17, 1975, 50-87598
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **2 Claims**



1. A disc brake comprising a stationary supporting member for mounting on a non-rotatable part of a vehicle on one side of a rotatable brake disc, a pair of arms on said supporting member spaced in the direction of the circumference of the disc and extending axially from the supporting member and straddling a portion of the circumference of the disc, a pair of friction pad assemblies slidably engaged with said arms for sliding movement in the direction of the axis of the disc, and clamping means for urging the friction pad assemblies against the opposite surfaces of the disc, each of the friction pad assemblies having T-shaped projection means on each of the circumferential ends thereof, and said arms each having complementarily shaped grooves therein in which said projection means are slidable, whereby braking drag is received by both of said arms when the disc is rotating in either direction.

4,044,865

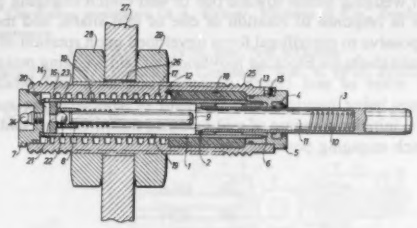
HYDRAULIC SHOCK ABSORBER

Pekka Tapio Tourunen, Sodertalje, Sweden, assignor to AB Mecman, Alvsjo, Sweden

Filed May 25, 1976, Ser. No. 690,044
Int. Cl.[2] F16F *9/44*
U.S. Cl. 188—287 **3 Claims**

1. A hydraulic shock absorber comprising a cylinder, a movable piston within said cylinder, a liquid receptacle outside the cylinder, at least one cylinder chamber within said cylinder and in communication with said receptacle through at least one narrow opening in the wall of said cylinder, said opening serving to damp the movement of the piston due to its resistance against the outflow of the liquid from the cylinder chamber, a sleeve enclosing said cylinder and having an internal thread having a slot which constitutes at least a part of said liquid receptacle, said thread having a crest which engages the

cylinder wall, whereby a change of the damping power is obtained by rotating the sleeve and the cylinder in relation to



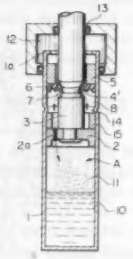
each other, so that the crest of the thread will more or less cover the cross-section area of the opening for the flow of liquid.

4,044,866

METHOD FOR FILLING GAS INTO GAS SPRING

Kunio Ishida, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed Dec. 15, 1976, Ser. No. 750,719
Claims priority, application Japan, Mar. 19, 1976, 51-30448
Int. Cl.[2] F16F *9/43*
U.S. Cl. 188—322 6 Claims



1. A method for filling gas into a cylindrical container having a rod slidably extending from one end thereof comprising the steps of forming passage means in the rod at a position adjacent to the inner end thereof, projecting the rod outwardly from the cylinder to its maximum extending position thereby forming a gas filling passage, by said passage means, communicating the inner end and the outer sides of an annular seal member which normally engages the rod sealingly and slidably, filling high pressure gas through the gas filling passage into the container, and moving the rod inwardly relative to the seal member to close the gas filling passage.

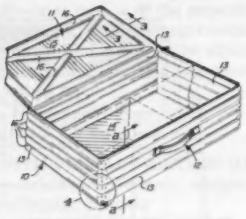
4,044,867

INFLATABLE LUGGAGE

Robert J. Fisher, 170 City Blvd. West, Apt. 201, Orange, Calif. 92668

Filed June 3, 1976, Ser. No. 692,444
Int. Cl.[2] A45C *7/00*
U.S. Cl. 190—43 6 Claims

1. Inflatable and collapsible luggage comprising:
a case having walls which define a storage compartment having a closeable opening,
the walls of said case being formed at least in part from a fluid impervious material and define a plurality of tubular interconnected passages,
handle means secured to said case,
a conduit connected to one of said passages for receiving air to inflate said passages and render said case rigid and self supporting,
said passages when inflated extending outwardly of said case to form a plurality of spaced ribs arranged in a ribbed configuration for protecting the case and its contents,
said case when deflated collapsing so that it can be folded or coiled for storage purposes,



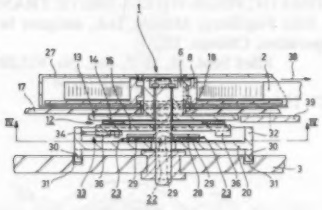
said handle means comprising means connected to said conduit for inflation and deflation of said passages.

4,044,868

SLIPPING COUPLING FOR A RECORDING AND/OR PLAYBACK APPARATUS

Erich Berger, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,358
Claims priority, application Austria, Dec. 16, 1974, 10034/74
Int. Cl.[2] F16D *67/02*
U.S. Cl. 192—12 B 5 Claims



1. A slipping clutch comprising a spindle, a first slipping clutch section rotatable about the spindle, a second slipping clutch section coaxial with the first section and rotatable about the spindle, a counter-bearing, means for controlling rotation of the counter-bearing, and an annular bearing part mounted coaxially with said slipping clutch sections, having a pair of first diametrically opposed bearing points which project in one direction of the spindle and engage the second section and having a pair of second bearing points which project in a direction opposite said first points, 90° offset with respect to said first point, and engage the counter-bearing, at least one of said pairs being formed as plain bearings for withstanding continuous rotation between said part and the surface engaged by said at least one pair.

4,044,869

RELEASE STOP FOR DISC CLUTCH

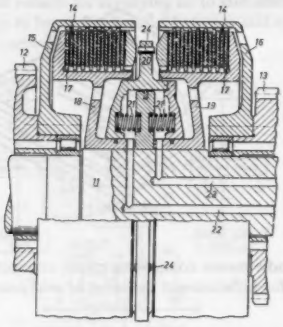
Hermann Gros, Friedrichshafen, Germany, assignor to Motoren- und Turbinen-Union Friedrichshafen GmbH, Germany

Filed June 2, 1975, Ser. No. 582,687
Claims priority, application Germany, June 28, 1974, 2431104
Int. Cl.[2] F16D *25/10*
U.S. Cl. 192—48.91 5 Claims

1. In a friction clutch comprising a plurality of interspersed friction disks disposed along an axis and first means including a pressure plate for compressing said plurality of friction disks along said axis, thereby engaging the clutch, the improvement comprising second means disposed at said pressure plate for determining an axial distance of said plurality of friction disks

in the noncompressed state dependent on a predetermned axial thickness of said plurality of friction disks,

wherein said second means includes a plurality of pins fitted into a plurality of corresponding axial bores through said pressure plate, said pins having a length exceeding the



axial thickness of said pressure plate, and said pins being slidable in said bores, and

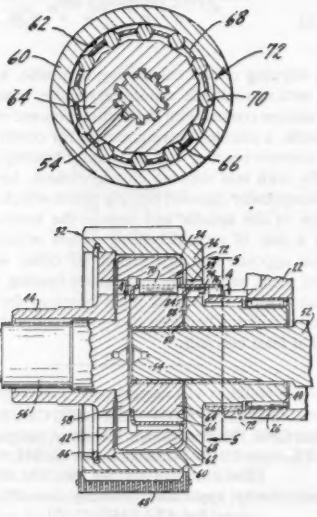
wherein said plurality of interspersed friction disks include two sets of said interspersed friction disks, each of said two sets disposed at opposing sides of said pressure plate.

4,044,870

AUTOMATIC FOUR-WHEEL DRIVE TRANSFER CASE

Mark John Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 19, 1975, Ser. No. 615,001
Int. Cl.² F16D *13/44*
U.S. Cl. 192—89 W **9 Claims**



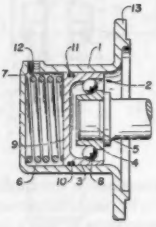
1. A torque transfer assembly comprising a housing, an input shaft supported for rotation in said housing, first and second output shafts supported for rotation in said housing, and means coupling said input shaft with said output shafts for transfer of torque thereto, said coupling means including an overrunning clutch having wedging means movable between two clutch engaging positions wherein torque is transferred to said second output shaft and a clutch disengaging position wherein torque is not transferred to said second output shaft, means biasing said wedging means toward one of said clutch engaging position in response to rotation of one of said shafts, and means responsive to centrifugal force developed upon rotation of one of said shafts for blocking movement of said wedging means to the other of said clutch engaging positions, said blocking means being movable into the path of said wedging means upon initial movement of said wedging means toward said one clutch engaging position.

4,044,871

HYDRAULICALLY OPERATED CLUTCH RELEASE BEARING

Heinz Kiener, Walgolshausen, Germany, assignor to SKF Industrial Trading and Development Company, B. V., Amsterdam, Holland

Continuation-in-part of Ser. No. 349,456, April 9, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,363
Claims priority, application Germany, Apr. 13, 1972, 2217942
Int. Cl.² F16D *25/08*
U.S. Cl. 192—91 A **3 Claims**



1. A hydraulic release mechanism for automobile clutches and the like comprising:

a cylindrical housing open at one end thereof to receive the operating member of a clutch and having inlet means therein adjacent an end thereof for the introduction of pressurized fluid thereinto;

a bearing located entirely and concentrically within said housing including a rotatable inner race ring adapted to be connected to the operating member of the clutch and a separable non-rotatable outer race ring one axial end of which defines with inner surfaces of said housing a pressure chamber for the pressurized fluid;

a plurality of roller elements located between said inner and outer race rings;

said non-rotatable outer race ring having the radially outer wall surface thereof in direct axially slidable engagement with the inner surface of said housing;

spring means located within said pressure chamber in engagement with said one axial end of said outer race ring and biasing same towards the other end of said housing so as to maintain said roller elements in operative engagement with the cooperable surfaces of said inner and outer race rings;

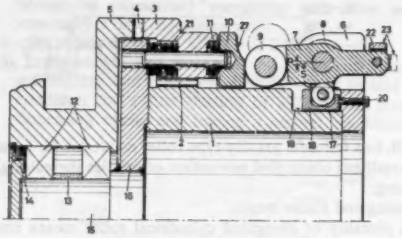
and seal means interposed between the said inner surfaces of the housing and said radially outer wall surface of the non-rotatable race ring to circumferentially enclose the same and to permit said outer race ring and said bearing to move axially within said housing on introduction of pressurized fluid into said housing.

4,044,872

COUPLING THE SWITCHING OF WHICH IS DEPENDENT ON THE ROTATIONAL SPEED

Josef Punsmann, Bocholt, and Ludger Hecking, Holtwick, both of Germany, assignors to A. Friedr. Flender & Co., Bocholt, Germany

Filed Apr. 5, 1976, Ser. No. 673,894
Claims priority, application Germany, Apr. 9, 1975, 2515351
Int. Cl.[2] F16D 23/10
U.S. Cl. 192—103 A 11 Claims



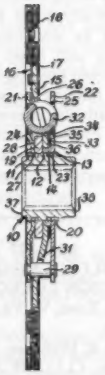
1. A coupling with switching dependent on rotational speed, comprising: switching elements, one coupling half held in fixed connection with another coupling half up to a switching speed by being supported on said switching elements, said switching elements being centrigually controlled and spring loaded, a switching ring, said switching elements being pivoted and coupled with one another by said switching ring for joint tilting.

4,044,873

DRIVEN PLATES FOR FRICTION CLUTCHES

David Parsons, and Keith Vernon Leigh-Monstevens, both of Leamington Spa, England, assignors to Automotive Products Company Ltd., England

Filed Dec. 22, 1975, Ser. No. 642,786
Claims priority, application United Kingdom, Dec. 31, 1974, 56233/74
Int. Cl.[2] F16D 3/66
U.S. Cl. 192—106.2 14 Claims



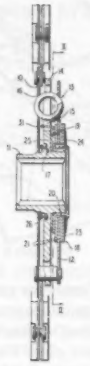
1. An annular hub component for assembly with an annular friction facing carrier and two annular disc-like members forming a clutch driven plate with said annular friction facing carrier being mounted for limited rotational movement on said hub component and said two annular disc-like members fixed directly and non-rotatably to said hub component to extend radially from said hub component, at least one of said annular disc-like members being fixed to said hub component by a fixing arrangement which comprises serrations formed on the inner peripheral edge of at least one annular disc-like member and engaged in corresponding grooves formed in said hub component, wherein said annular hub component has at least one radially outwardly projecting annular rim with a frusto-conical outer peripheral surface extending over the total axial length of the radially-outer surface of the respective annular rim, the smaller diameter end of said frusto-conical outer peripheral surface portion being nearer to the adjacent end of said hub component toward which said frusto-conical outer peripheral surface portion tapers.

4,044,874

CLUTCH DISC WITH PLURAL FRICTION DAMPERS

Günter Wörner, Rommelshausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 15, 1974, Ser. No. 461,115
Claims priority, application Germany, Apr. 14, 1973, 2318908
Int. Cl.[2] F16D 3/66
U.S. Cl. 192—106.2 12 Claims



1. In a clutch disc arrangement for main clutches which includes a disc means carrying friction linings, a hub means having a hub flange, said disc means being operatively connected with the flange of said hub means, side plate means, means for rigidly connecting said side plate means to said disc means, a first set of window means provided in said hub flange, a second set of window means provided in said disc means in alignment with said first set of window means, a third set of window means provided in said side plate means in alignment with said first and second set of window means, several spring means having respectively harder characteristics for producing a multi-stage operation of the clutch disc arrangement, said spring means being arranged in the window means of said hub flange, said disc means, and said side plate means, said spring means includes individual springs defining four stages, each spring being arranged in a respective set of aligned window means, and at least two friction means for damping vibrations of the clutch disc arrangement, a first of said friction means being operatively connected with the softest of the springs, a second of said friction means being operatively connected with at least one of the harder springs, the improvement comprising: control plate means mounted on said hub means for determining the starting point of operation of at least one of the friction means, the control plate means including means for engaging at least one of the two parts consisting of spring means and window means to render effective the friction means operatively connected with a relatively harder spring stage during the operating range of a preceding softer spring stage, the operation of the first friction means begins with the operation of the first spring stage and the operation of the second friction means begins with the operation of the third spring stage, and wherein said control plate means is mounted on said hub means

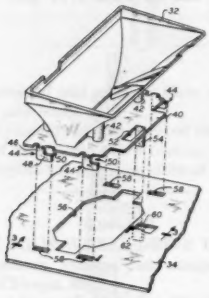
so that a spacing is provided between said engaging means and the part consisting of at least one of the window means and spring ends of the third spring stage, said friction means being operatively effective in only one direction of rotation of the clutch disc arrangement.

4,044,875

REMOVABLE FUNNEL FOR A COIN OPERATED APPARATUS

Harry Greenwald, Whitestone, and Salvatore Iglio, Valley Stream, both of N.Y., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed June 14, 1976, Ser. No. 695,763
Int. Cl.[2] G07F *1/04*
U.S. Cl. 194—1 K **6 Claims**



1. A removable coin funnel for catching coins deposited in a housing of a coin operated apparatus and directing said coins to a coin receiving location within said housing, and in which the housing has a support plate formed having a plurality of slotted openings and a blocking tab, said funnel comprising:

a. mounting means for mounting said funnel in said housing and permitting movement of said mounted funnel between a first position wherein said funnel is removable from said housing and a second position wherein said funnel is prevented from being removed therefrom;

b. said mounting means comprising a plurality of hook members each projecting outwardly from said funnel and adapted to be received in a separate one of said support plate openings to permit said funnel to be removably mounted in its first position, each of said hook members having a portion spaced from said funnel to define a passage adapted to receive therein an edge portion of said support member defining the associated opening when said mounted funnel is moved to its second position in engagement with said support member; and,

c. locking means disposed for bending movement from an unlocked position to a locked position when said funnel is in its second position

d. said locking means comprising a tab member projecting outwardly from said funnel and adapted to be received in another one of said support plate openings when said funnel is mounted in its first position, said locking tab being adapted to engage with the blocking tab of said support plate when said funnel is in its second position and said locking tab is bent to its locked position to prevent movement of said funnel from its second position to its removable first position;

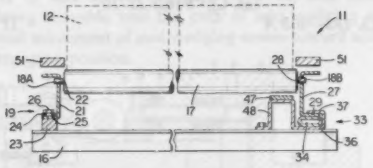
whereby said funnel is removable from said housing by moving said locking means to its unlocked position and then moving said funnel from its second position to its removable first position.

4,044,876

FAIL-SAFE GRAVITY CONVEYOR

Theodore A. Hammond, 3575 52nd St., S.E., Kentwood, Mich. 49508

Filed Apr. 30, 1976, Ser. No. 682,051
Int. Cl.[2] B65G *13/00*
U.S. Cl. 193—35 SS **12 Claims**



10. In a fail-safe, gravity-type roller conveyor for permitting intermittent controlled movement of articles therealong, comprising:

elongated frame means;

a plurality of elongated cylindrical roller means rotatably supported on said frame means, said roller means being disposed with their axes extending substantially horizontally and in spaced parallel relationship, said roller means having their upper surfaces disposed on a declining plane which extends at a small acute angle relative to the horizontal so as to permit said articles to move by gravity along said plurality of roller means;

braking means for controlling the gravity-induced movement speed of said articles along said plurality of roller means, said braking means being fixed relative to and extending longitudinally along said frame means;

support means for supporting said plurality of roller means at one axial end thereof for permitting angular displacement of said plurality of roller means in a vertical direction substantially about said one axial end;

lifting means coacting between said frame means and said plurality of roller means for causing intermittent and periodic vertical reciprocating movement of said other axial end of said plurality of roller means in a cyclic manner between a raised position permitting gravity-urged movement of the articles along said roller means and a lowered position wherein said articles are stopped by said braking means, said lifting means causing said roller means to effectively vertically pivot about said one axial end thereof as defined by said support means, said lifting means also causing said roller means to automatically move into said lowered position upon failure of said lifting means so that said braking means stop said articles; and

control means operatively interconnected to said lifting means for causing cyclic actuation thereof to cause said roller means to vertically pivot back-and-forth between said raised and lowered positions in a periodic and repetitive manner.

4,044,877

MULTIPLE COLUMN VENDING MACHINE MALFUNCTION LOCKOUT CIRCUIT

Paul F. Burton, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Ransom, W. Va.

Filed Feb. 6, 1976, Ser. No. 655,846
Int. Cl.[2] G07F *5/22*
U.S. Cl. 194—10 **10 Claims**

1. A control circuit for a multiple-selection, independent column vending machine, said control circuit comprising:

a. coin operable credit establishing means having a first condition corresponding to the establishment of credit upon deposit of proper coinage, and a second condition corresponding to the cancellation of credit;

b. a plurality of customer operable product selection means, one selection means corresponding to each column, and

each of said selection means having a momentary operable state;

c. a plurality of individual product dispensing means, each of said dispensing means operatively connected to one of said independent columns for dispensing a product;

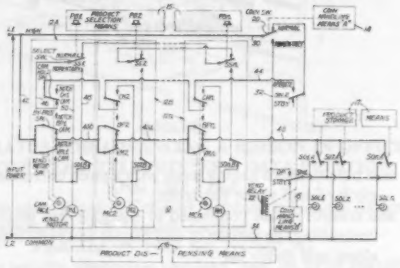
d. a plurality of individual actuating circuits corresponding to each column, each of said actuating circuits operatively connected for actuating a corresponding product means;

e. each of said actuating circuits comprising:

i. drive motor means operable, in response to the momentary operable state of a corresponding product selection means for momentary energizing said drive motor means, by a first energizing path;

ii. cam means driven by said drive motor means;

iii. first cam actuated means having a first condition for maintaining said credit establishing means in said first condition for a first portion of a complete product dispensing cycle, and having a second condition for



maintaining said credit establishing means in said second condition for a second portion of said dispensing cycle;

iv. second cam actuated means, having an initial condition and actuatable to a second condition by said momentary motor energization, for establishing a second motor energizing path to maintain energization of said motor means during said first portion of said dispensing cycle;

v. said first cam actuated means further providing a third motor energizing path for energizing said motor means during said second portion of said dispensing cycle; and

vi. lockout switching means, operable directly by said cam means such that during a malfunction condition of said product dispensing means during said second portion of said dispensing cycle, said lockout switching means provides an alternate circuit path comprising a portion of said third motor energizing path for maintaining said credit establishing means in said first condition during a first portion of a subsequently ordered dispensing cycle.

4,044,878

MATRIX PRINTER HEAD HAVING A REMOVABLE ASSEMBLY

Helfrid Kunath, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 696,031

Claims priority, application Germany, June 18, 1975, 2527186

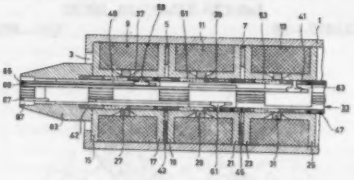
Int. Cl.[2] B41J *3/50*

U.S. Cl. 197—1 R **7 Claims**

1. A matrix printer head comprising a housing, a plurality of substantially straight printing pins having free ends for printing, means for mounting and guiding said pins in said housing so that said pins are mutually parallel and displaceable in their longitudinal direction, said free ends being arranged in a line, and magnetic means for displacing respective pins,

wherein said head has a cylindrical bore extending in said longitudinal direction through said housing, and an axially removable assembly arranged in said bore, said pins and said mounting and guiding means forming part of said assembly; and

said assembly comprises a cylindrical guide formed by at least two mating semi-cylindrical rods, said guide having a corresponding plurality of longitudinally extending adjacent guide means for said printing pins; means for retaining the assembly in the bore; a corresponding plurality of armatures forming part of said means for displacing,



respectively slidably mounted at longitudinally separated locations on an outer surface of said cylindrical guide for displacement in said longitudinal direction, concentric with said bore; and means connecting individual printing pins to respective armatures for longitudinal displacement therewith.

4,044,879

ARRANGEMENT FOR RECORDING CHARACTERS USING MOSAIC RECORDING MECHANISMS

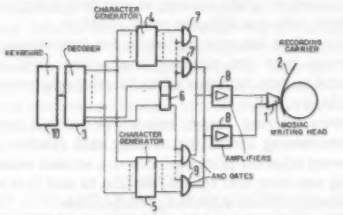
Horst Stahl, Weidach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,642

Claims priority, application Germany, Mar. 7, 1975, 2510044

Int. Cl.[2] B41J *3/04*

U.S. Cl. 197—1 R **6 Claims**



1. A device for recording characters on a recording carrier, comprising:

recording means comprising a mosaic recording head including a plurality of first recording members which may be activated to record characters of a first height and a plurality of second recording members which may be activated to extend the recording height to a second height; and

recording height control means connected to said recording head and including a signal input, said recording height control means responsive to first input signals to selectively activate said first recording members to record characters of the first height and responsive to alternately received second input signals to selectively activate said first and second recording members to record characters of the second height.

4,044,880

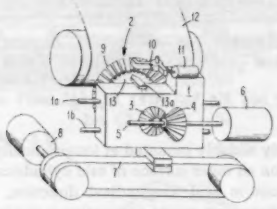
HIGH SPEED WHEEL PRINTER AND METHOD OF OPERATION

Blair Robertson Martin, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 427,962, Dec. 26, 1973, abandoned. This application Sept. 29, 1975, Ser. No. 617,913

Int. Cl.[2] B41J *1/26, 19/30*

U.S. Cl. 197—18 **18 Claims**



8. A serial printer apparatus comprising in combination

a print mechanism operable for printing a line of characters or the like at plural uniformly-spaced print positions along a print line on a record medium,

said print mechanism including a movable print element carrying a plurality of type characters in a predetermined fixed arrangement,

said print mechanism having variable set-up times for presenting individual type characters on said print element depending on the relative location of said type characters on said print element during printing,

means for effecting a relative motion of said print mechanism and said record medium whereby said print mechanism is positioned successively at each of said plural print positions along said print line,

means for operating said print mechanism to effect recording of a succession of characters at said plural print positions during said relative motion,

means operable for maintaining said relative motion at a constant first velocity when said set-up times for successive type characters to be printed at successive adjacent print positions occur within the traverse time of said print mechanism while moving at said first velocity across the space between adjacent print positions,

traverse time determining means for determining when said set-up time for printing a character will exceed the traverse time between adjacent print positions at said first velocity, and

velocity altering means responsive to said traverse time determining means for altering said relative motion between adjacent print positions to a second velocity including restoring said relative motion to said first velocity for printing at said adjacent print position.

4,044,881

SERIAL PRINTER WITH LINEAR MOTOR DRIVE

Hi Dong Chai, Binghamton, and Joseph Paul Pawletko, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1976, Ser. No. 676,584

Int. Cl.[2] B41J *19/30*

U.S. Cl. 197—82 **10 Claims**

1. A serial printer apparatus comprising in combination:

a print mechanism operable for recording data marks or the like on a print medium, and

drive means for causing said print mechanism to traverse said print medium in a fixed path corresponding with a print line on said print medium,

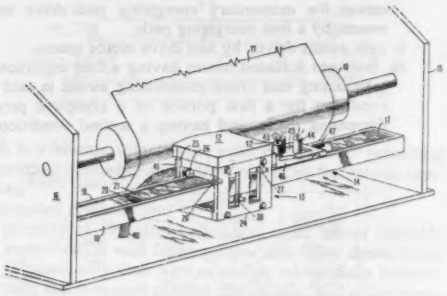
said drive means comprising a linear stepper motor having a magnetic stator bar fixed in a position substantially parallel with said fixed path,

said stator bar having at least one surface with teeth extending along the direction of said fixed path,

said teeth having a pitch proportional to the spacing of print positions on said print line,

a carrier for said print mechanism movably mounted on said stator bar,

said carrier including an armature formed with poles having surfaces cooperative with said surface of said stator bar and windings on said poles,



said pole surfaces having teeth with a pitch correlated to the pitch of said stator bar teeth,

and control means connected to energize said windings for controlling the motion of said carrier and print mechanism along said stator bar

said control means including sense means movable with said carrier and coating with the teeth of said stator bar for generating control signals useful in the operation of said printer apparatus.

4,044,882

APPARATUS FOR MOVING A PRINTER CARRIAGE

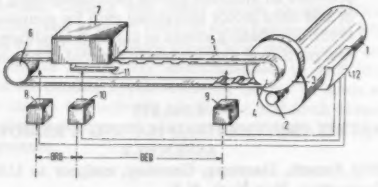
Robert Weinke, Munich, and Georg Wiesmeier, Weidach, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 15, 1975, Ser. No. 613,475

Claims priority, application Germany, Sept. 20, 1974, 2445081

Int. Cl.[2] B41J *19/30*

U.S. Cl. 197—82 **1 Claim**



1. A method for controlling the positioning of a printer carriage wherein a reversible stepping motor drives said carriage in forward and reverse directions along a row and a plurality of signal generators are spaced along said row for selective actuation by said carriage, a first one of said generators being fixed at a selected line-commence location, a second at a line-end location, and a third signal generator at an intermediate location spaced adjacent said line-commence location, said carriage carrying a control strip means for actuating said third generator while said carriage is between said line-commence and intermediate locations, and said motor having a control unit comprising a timing pulse generator, a coincidence signal generator, and an AND- logic circuit, said method comprising the steps:

moving said carriage stepwise in a forward direction, a

plurality of steps constituting one type-character space or column;

operating said stepping motor for carriage return in a reverse direction of rotation in its maximum torque range;

generating at intervals a coincidence signal from said coincidence signal generator as a function of timing pulses which govern rotation of the stepping motor;

triggering an output signal from said logic circuit upon carriage return by a coincidence of a signal from said coincidence signal generator and a signal from said first signal generator; and

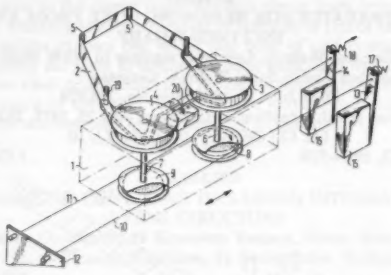
employing said output signal in said control means to terminate said timing pulses from said timing pulse generator to stop the return movement of said carriage selectively adjacent said line-commence location.

4,044,883

APPARATUS FOR ADVANCING A RIBBON IN OFFICE TYPEWRITERS, TELEPRINTERS, DATA PRINTERS AND THE LIKE

Georg Boehmer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 25, 1975, Ser. No. 607,192
Claims priority, application Germany, Aug. 30, 1974, 2441694
Int. Cl.² B41J *33/32*
U.S. Cl. 197—151 **9 Claims**



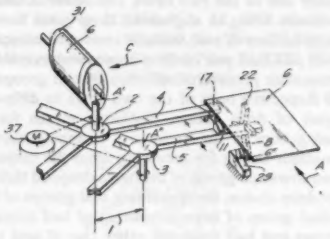
1. A ribbon-type printing machine comprising a stationary member, a type carrier carriage mechanism, means for moving said type carrier carriage mechanism relative to said stationary member in a line-typing direction, and a ribbon advancing, mechanism comprising ribbon reel means including a ribbon reel for receiving ribbon windable thereabout upon rotation thereof, drive roller means including a drive roller for rotating said ribbon reel, means rotatably mounting said ribbon reel and said drive roller on said type carrier carriage mechanism for movement therewith in the line-typing direction, means interconnecting said drive roller and said ribbon reel for corotation, a cable fixed at one end to said stationary member extending substantially in parallel relation to said line-typing direction and in tangential relation to said drive roller except for a portion thereof looped around said drive roller for rotating same upon tensioning of said cable relative to said stationary member, and cable tensioning means attached to the other end of said cable for selectively tensioning said cable to rotate said drive roller and said ribbon reel whereby upon tensioning of said cable, the movement of said carriage mechanism relative to said stationary member serves to cause a rotation of said drive roller and a corresponding ribbon advancing movement.

4,044,884

APPARATUS FOR ORIENTING A FLAT WORKPIECE

Josef Opletal, Karl-Marx Stadt, Germany, assignor to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed June 16, 1976, Ser. No. 696,498
Claims priority, application Germany, June 16, 1975, 186650
Int. Cl.² B65G *47/24*
U.S. Cl. 198—415 **10 Claims**



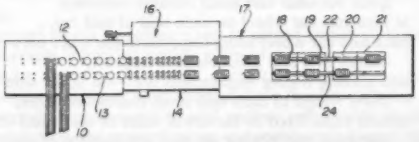
1. An apparatus for orienting a flat workpiece, said apparatus comprising: a support; first and second hubs rotatable on said support about respective spacedapart first and second rotation axes; respective radially extending elongated first and second arms mounted on said first and second hubs; respective first and second levers pivotal on said first and second arms about respective first and second pivot axes parallel to said first and second arms at locations thereon spaced from said first and second rotation axes; respective first and second workpiece-engaging elements mounted on said first and second levers at substantially like spacings from said first and second rotation axes, each lever being pivotal between an operative position with the respective element engageable with a workpiece and an inoperative position unengageable with a workpiece; respective first and second cam followers on said first and second levers; a first cam on said second arm engageable in a predetermined angular position of said first and second arms with said first cam follower to pivot said first lever from its inoperative into its operative position; a second cam on said support engageable in said predetermined angular position of said arms with said second cam follower to pivot said second lever from its inoperative into its operative position; respective first and second locking means on said arms each operable for maintaining the respective levers in their operative positions for a predetermined angular travel of the respective lever from said predetermined position; and means for rotating said hubs about their rotation axes in the same direction.

4,044,885

METHOD AND APPARATUS FOR COUNTING AND LOADING ITEMS, PARTICULARLY COOKIES, INTO PACKAGES AND THE LIKE

Edward Rose, Skokie, and Robert A. Roth, Chicago, both of Ill., assignors to Peters Machinery Company, Chicago, Ill.

Filed July 2, 1976, Ser. No. 702,012
Int. Cl.² B65G *47/26*
U.S. Cl. 198—419 **12 Claims**



1. Apparatus for conveying items such as cookies and the like, said items being conveyed in two rows in parallel spaced-

apart relation and being of one kind in one of said rows and of another kind in the other one of said rows, said apparatus comprising a counting conveyor means for conveying, counting and separating the items in each of the two rows into spaced aligned groups, a transfer conveyor means forming a continuation of said counter conveyor means, at least a first pair of drop chutes mounted in item receiving relation with respect to said transfer conveyor means, each of said first pair of drop chutes receiving in consecutive fashion one group of items from one of the two rows and one group of items from the other one of the two rows, the outlet of said first pair of drop chutes being in alignment, drop gates forming an item carrying surface of said transfer conveyor means and extending over said first pair of drop chutes and movable laterally to accommodate predetermined ones of said groups of the items in the respective ones of the two rows to drop through said first pair of drop chutes, discharge means for discharging stacked groups of the items to a wrapping machine, and an accumulator means for receiving from the respective ones of the two rows one group of the items dropped through said first pair of drop chutes, for combining said groups of items to form a stacked group of items consisting of half items from one of said rows and half from the other one of said rows, and for delivering said stacked group of items to said discharge means.

4,044,886

SYSTEM FOR HANDLING STRUCTURAL MEMBERS

Wilfred E. Sender, 742 Cooper Ave., Johnstown, Pa. 15906

Filed Dec. 29, 1975, Ser. No. 644,564
Int. Cl.[2] B65G *47/54*
U.S. Cl. 198—488 **4 Claims**

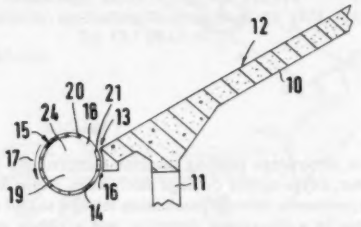
1. A conveyor system for moving elongated structural members to a saw adjacent a roller conveyor comprising,
a roller conveyor having spaced rollers with an axis of rotation disposed perpendicular to the direction of travel of said roller conveyor,
spaced conveyor members disposed transversely of the direction of travel of said roller conveyor and supported adjacent said roller conveyor,
each said conveyor member comprising,
two large spaced channel members having their webs adjacent to each other and disposed in parallel planes with the flanges of said large channels extending away from each other,
the top surface of each said large channel member being disposed below a plane passing through the top of the rollers of said roller conveyor,
spaced angle members fixed to the lower flanges of said large channel members and extending therebetween,
each said angle member having a top surface inclined upwardly and in a direction toward said roller conveyor,
two spaced small channel members disposed between said large channel members and having their flanges extending toward each other and defining a space therebetween,
a car having a load supporting member disposed in said space between said small channel members,
at least one car wheel on each said of said car,
each said car wheel being disposed in the space between the flanges of a said small channel member,
and making rolling engagement with the upper side of the lower flange of each said small channel member,
spaced cams fixed to the lower sides of said small channel members and resting on said top surface of said angle members,
a hydraulic cylinder having a piston rod,
said hydraulic cylinder and piston rod being connected between said large channel members and said small channel members for moving said small channel members axially between said large channel members whereby said cam surfaces move up and down along said inclined surfaces and said small channel members are moved upwardly in translation relative to said large channel members whereby the top of said car is moved above the level of said rollers and may be moved down,
two spaced sprocket members,
each said sprocket member being supported on an axle extending between said small channel members and supported on said small channel members,
a chain supported on said sprocket members,
said chain being connected to said car between the adjacent ends of the flanges of said small channel members and motor means driving said chain for moving said car along said small channel members,
said hydraulic cylinder being adapted to move said small channel members axially relative to said large channel members whereby said car is lifted by said cam to bring the top surface thereof above said large channel members whereby an article supported on said large channel members will be lifted by said car from said large channel members and may be moved toward said roller conveyor by said motor means through said chain.

4,044,887

APPARATUS FOR REMOVING COKE FROM AN INCLINED WHARF

Wilhelm Stog, Waltrop, Germany, assignor to WSW Stahl- und Wasserbau GmbH Selm, Waltrop, Germany

Filed July 26, 1976, Ser. No. 708,874
Claims priority, application Germany, July 25, 1975, 2533394
Int. Cl.[2] B65G *37/00;* G01F *11/10*
U.S. Cl. 198—526 **7 Claims**



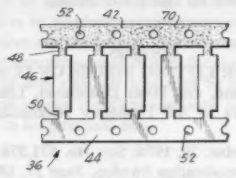
1. In an apparatus for uniformly and controllably removing coke delivered continuously from an inclined wharf without any retaining grate and in combination with a horizontal endless conveyor belt arranged below and extending longitudinally of the lower discharge end of said wharf which has a concave-shaped end surface, a rotatably mounted and continuously driven roll openly disposed at said discharge end of said wharf for uniformly transferring the coke in measured quantities on to said horizontal conveyor, said roll being provided with a circumferential shell enclosing a chamber within the cavity of said hollow roll, said concave-shaped end surface forming a gap with the respective opposite-adjacent surface portion of said circumferential shell, said chamber having a peripheral aperture provided in said circumferential shell, said peripheral aperture extending helically over the periphery and extending longitudinally over the entire length of said roll but only a small portion of the periphery of said chamber.

4,044,888

PREFABRICATED CONTACTS FOR PRINTED CIRCUIT CARD CONNECTORS

Herbert I. Schachter, 86 Campbell St., New Hyde Park, N.Y. 11040

Filed Oct. 23, 1975, Ser. No. 625,090
Int. Cl.[2] B65P 73/02; B23P 15/16
U.S. Cl. 206—330 23 Claims



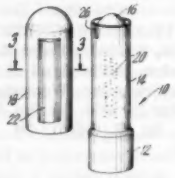
1. An arrangement of conductive contact elements for mounting on a printed circuit board to form an array of serially spaced contacts or terminals at the free ends of a plurality of circuit leads or conductors on the circuit board, the arrangement comprising a pair of elongate spaced carriers which are parallel to each other; a plurality of contacts made from an electrically conductive material and being generally co-planar with said carriers, said contacts being serially spaced along the length direction of said carriers and extending between and being connected at opposing ends to the same to maintain the spacing between said contacts, at least one portion of each of said plurality of contacts being substantially planar and coplanar with at least one of said carriers and configurated to mate with the surface of the printed circuit board to which it is adapted to be abutted, at least one of said pair of elongate spaced carriers positioning said contacts during attachment of the same to the circuit board and said circuit leads or conductors; whereby selective removal of portions of one of said pair of carriers exposes one set of free ends of said contacts for attaching the same to similarly spaced associated free ends of circuit leads or conductors on the circuit board and subsequent severance of the other of said pair of carriers to electrically isolate selected ones of said plurality of contacts.

4,044,889

COSMETIC CONTAINER INCLUDING INTEGRATED LENS STRUCTURE

Seymour Orentreich, 99 Greenway Terrace, Forest Hills, N.Y. 11375, and Joseph Vogelman, 48 Green Drive, Roslyn, N.Y. 11576

Filed Sept. 13, 1976, Ser. No. 722,527
Int. Cl.[2] B65D 25/54; G02C 11/02
U.S. Cl. 206—459 2 Claims



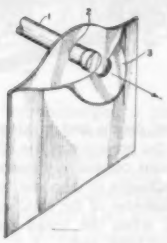
1. A cosmetic container comprising a first member adapted to contain a cosmetic material therein and carrying on an external surface thereof indicia descriptive of said cosmetic material, said indicia being of a relatively small size that is difficult to read with the naked eye, a second cover member placed in overlying relationship with said first member when said container is in a closed condition, said second member including a thin Fresnel lens magnifying element integrally formed as part thereof and conforming in shape to at least a portion of said cover member and thereby constituting a part of the overall aesthetic appearance of said cover member, said Fresnel lens overlying and being in registration with said indicia, such that said Fresnel lens is effective to magnify said small-size indicia on said first member to an apparent size that can be read when the container is in its said closed condition.

4,044,890

METHOD OF STORING HANDLE BAGS

Erik Kramming, Saltsjobaden, Sweden, assignor to Bengt Lundin AB, Arvika, Sweden

Continuation of Ser. No. 415,854, Nov. 14, 1973, abandoned.
This application Nov. 20, 1975, Ser. No. 633,880
Claims priority, application Sweden, Nov. 24, 1972, 7215339
Int. Cl.[2] B65D 73/00
U.S. Cl. 206—493 5 Claims



1. A bag supporting and dispensing arrangement comprising in combination:

a. a bundle of bags, each bag having only two handle openings consisting of a first handle opening located on one side of the bag and a second handle opening located on the opposite side of the bag, the first handle opening of each bag being aligned with the first handle opening of every other bag in the bundle, the second handle opening of each bag being disposed so that it is out of circumferential alignment with said aligned first handle openings, and

b. an elongated supporting member for slideably supporting said bundle of bags, said elongated supporting member passing through all of the said aligned first handle openings of each bag in the bundle, the discharge end of said supporting member being shaped to inhibit but not prohibit the removal of each first handle opening therefrom, the second handle opening of each bag being closer to the discharge end of the supporting member than the first handle opening of said same bag.

4,044,891

CAN TESTING CONVEYOR

Raymond F. Pynsky, Barrington, Ill., assignor to dun-Rite Erectors, Inc., Elk Grove Village, Ill.

Filed Jan. 12, 1976, Ser. No. 648,270
Int. Cl.[2] B07C 5/02
U.S. Cl. 209—73 9 Claims

1. A transporter for controlling the movement of articles through a monitoring station whereat a parameter of each article is tested and those articles determined to vary from predetermined limits are removed from the transporter, comprising

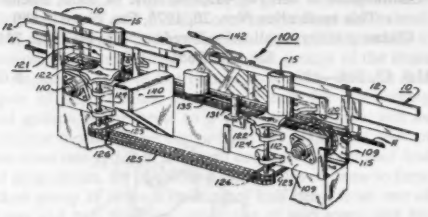
transport means including a pair of spaced transport chains movable in parallel endless paths of movement,

support means positioned in contact with said transport chains forming a fixed support base therefore during a portion of movement in said endless path, guide means carried by said support means and positioned adjacent the path of movement of said transport chains to control lateral movement thereof,

said transport means positionable on-line in a conveying system for transporting articles from an entrance position whereat the articles are conveyed from the conveying system to the transport means through an exit position whereat the articles are passed from the transport means to the conveying system,

index means positioned adjacent said entrance position for controlling the spacing between articles being transported by said transport means,

detecting means positioned adjacent said index means for detecting the presence of an article being transported by



said transport means and producing a control signal in response to the presence of the article,

monitoring means operatively connected to said detecting means and actuable in response to said control signal for testing a parameter of the articles and producing a command signal when the tested parameter varies from a predetermined limit, and

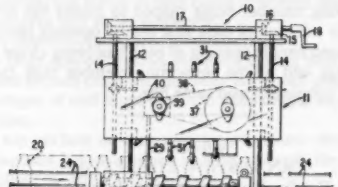
reject means positioned adjacent said transport means and operatively connected to said monitoring means for actuation in response to said command signal to remove articles from said transport means when the tested parameter varies from the predetermined limits.

4,044,892

CONTINUOUS PLUG GAUGER FOR CONTAINER OPENINGS

Theodore G. Loos, Oscawana Heights Road, Putnam Valley, N.Y. 10579

Filed Apr. 26, 1976, Ser. No. 680,196
Int. Cl.² B07B *13/04*
U.S. Cl. 209—73 **4 Claims**



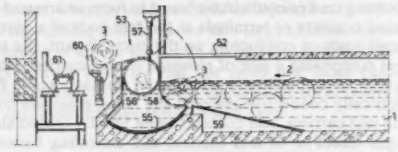
1. In an apparatus for gauging containers, the combination of means for conveying a plurality of containers to be gauged along a straight line, endless chain means disposed above said container conveying means straight line and having a first run spaced above said conveying means straight line and a second run spaced vertically above said first run, a guide frame for said chain means, a plurality of gauging devices mounted upon said chain means and spaced thereon corresponding to the spacing between said containers in said conveying means, each gauging device having a go-no go gauge reciprocally mounted thereon and freely movable axially of said device between an extended gauging position and a retracted position, a horizontally movable pin on said gauge, means for moving said pin horizontally to a reject position when said gauge indicates no go and for returning said pin to its normal non-reject position, means for retracting each of said gauges at the end of said first run, said gauges each remaining in their retracted positions through said second run and moving into their extended positions as each gauge is moved to the beginning of said first run, and said pin moving and returning means comprising first and second cams mounted on said guide frame.

4,044,893

DEVICE FOR LIFTING PIECES OF LUMBER

Rolf Ekholm, Nyland, and Hans Danielsson, Ljusne, both of Sweden, assignors to AB Hammars Mekaniska Verkstad, Nyland, Sweden

Filed Mar. 29, 1976, Ser. No. 671,376
Claims priority, application Sweden, June 27, 1975, 7507383
Int. Cl.² B66F *9/04*
U.S. Cl. 214—1 PB **1 Claim**



1. A lumber lifting device for removing pieces of lumber which are free floating in a liquid such as water in an elongate soaking basin, which pieces are fed to the lifting device in their transverse direction, said device comprising:

hoisting means including a concave hoisting surface and a stopping surface connected to said hoisting surface on the bottom of a front outter edge of said hoisting surface;

said basin including an upwardly inclined surface extending from the bottom of said basin toward said hoisting means with an upper edge below the water level of said basin adjacent the surfaces of said hoisting means; and

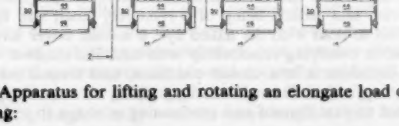
means for rotating said hoisting means less than one-half revolution from a first reception position with said hoisting surface outter edge substantially aligned with said upper edge of said inclined surface below the water level of said basin to receive one or more pieces of lumber and a second dumping position with said hoisting surface above the water level to discharge said pieces of lumber and said stopping surface extending below the water level adjacent said upper edge of said inclined surface to prevent pieces of lumber from interfering with the rotation of said hoisting means.

4,044,894

LOAD TILTING MAGNETIC LIFT

Donald C. McDonald, Sherborn; Roger B. Ela, Spencer, and Francis E. Whittaker, Holliston, all of Mass., assignors to Walker Magnetics Group, Inc., Worcester, Mass.

Filed May 25, 1976, Ser. No. 689,729
Int. Cl.² B66C *1/04*
U.S. Cl. 214—1 QD **15 Claims**



1. Apparatus for lifting and rotating an elongate load comprising:

a plurality of electromagnets;

a corresponding plurality of yokes arranged in linear array and pivotally supporting respective ones of said electromagnets for rotation about essentially aligned axes;

a corresponding plurality of stepping motors, each of said motors being resiliently coupled to a respective electromagnet to effect torque sharing between the motors and to allow each motor to gradually engage the load during start-up to minimize stalling, each of said motors being operative to produce precise, incremental rotation of the respective electromagnet about the said aligned axes; and

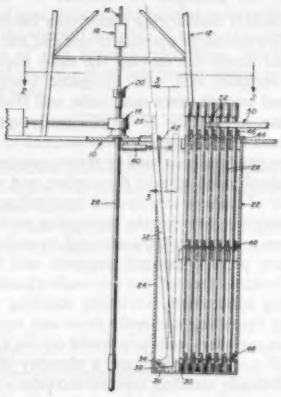
means for energizing said motors for synchronous operation, whereby said elongate load may be lifted by said electromagnets acting together and may be rotated essentially about its longitudinal axis.

4,044,895

PIPE RACKING SYSTEM

Lewell Seidell Adair, Fort Smith, Ark., assignor to Barney Sills Adams, Jr., Fort Smith, Ark.

Filed June 4, 1976, Ser. No. 692,785
Int. Cl.² E21B *19/00*
U.S. Cl. 214—2.5 **5 Claims**



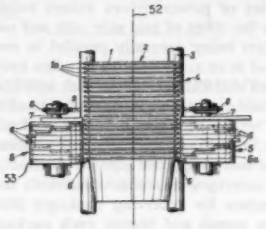
1. A pipe rack system for well drilling apparatus including a platform with a rotary table in operative position thereon and a drilling derrick rising thereover, said pipe rack system comprising a vertically elongated pipe container rigid with and depending from said platform in closely spaced relation to the rotary table, said container opening upwardly through said platform, said container having a base and peripheral walls including a near wall between the container and the rotary table, a pipe rack within said container, pipe handling means operative for a manipulation of pipe within said container, a pipe chute positioned within said container adjacent said near wall for receiving and supporting pipe along the length thereof, said pipe chute being movable between a first substantially vertical position orientating chute-received pipe substantially vertically and in cooperative relationship with the pipe handling means, and a second position inclined toward the rotary table for selective reception of pipe into or discharge of pipe from the container, said chute having a lower end and an upper end, means pivotally mounting the lower end of the chute inward of said near wall, and power means engaged with the chute adjacent the upper end thereof for a pivotal movement of the chute about the lower end between said first substantially vertical position for orientation of pipe in cooperative relationship with the pipe handling means and said second position inclined toward the rotary table for selective reception or discharge of pipe.

4,044,896

APPARATUS FOR DISCHARGING STACKED ARTICLES IN DISCRETE GROUPS

Guenter Reinecke, Solingen-Graefrath, Germany, assignor to Benz & Hilgers GmbH., Dusseldorf, Germany

Filed Sept. 17, 1976, Ser. No. 724,077
Claims priority, application Germany, Oct. 7, 1975, 2544754
Int. Cl.² B65G *59/10*
U.S. Cl. 214—8.5 H **4 Claims**



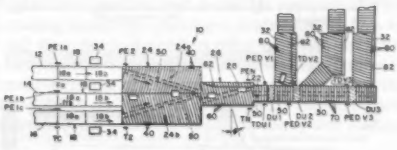
1. In an apparatus for discharging a plurality of stacked articles each having a peripheral rim, means for supporting the plurality of articles in vertically stacked relation, at least a pair of rotatably ganged cylindrical blocking members having vertical axes and disposed in circumferentially spaced relation around the periphery of the rims of the article stack, the blocking members respectively having corresponding axially spaced projections extending horizontally from the periphery thereof and engageable with the lower surfaces of the peripheral rims of the N lowermost successive ones of the stacked articles, and cyclically operable means for progressively moving the successive projections on the blocking members into engagement with the lower ends of the peripheral rims of the N lowermost articles in the stack and for thereafter discharging the N engaged lowermost articles from the bottom of the supporting means, the projection on at least one of the blocking members being adapted to inhibit a downward movement of the stacked articles overlying the lowermost N articles during the engagement and discharge of said N lowermost articles, whereby the articles are discharged from the apparatus in discrete groups of N articles each.

4,044,897

CONVEYOR SORTING AND ORIENTING SYSTEM

Wesley R. Maxted, Grand Rapids, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Jan. 2, 1976, Ser. No. 646,237
Int. Cl.² B65G *47/00*
U.S. Cl. 214—11 R **8 Claims**



1. A high speed sorter for sorting packages comprising:

a plurality of infeed conveyors;

a plurality of induction conveyor means coupled with said infeed conveyors for receiving packages from said infeed conveyors;

a merge conveyor means coupled with said induction conveyor means for receiving packages from said induction conveyor means and biasing said packages deposited thereon toward a generally centrally located discharge point, said induction conveyor means discharging pack-

ages on said merge conveyor means in a spaced relationship said merge conveyor means comprising:

a support frame including a longitudinally extending central rail and longitudinally extending spaced side rails;

a first set of power driven rollers rotatably mounted between one of said side rails and said central rail, said rollers being generally parallel to one another and skewed at an angle relative to a line extending perpendicular to said central rail so that said rollers bias articles to converge toward said central rail in the direction of package movement; and

a second set of power driven rollers rotatably mounted between the other of said side rails and said central rail, said rollers being generally parallel to one another and positioned at an angle relative to a line extending perpendicular to said central rail so that said rollers converge toward said central rail in the direction of package movement, whereby packages inducted onto said merge conveyor at transversely spaced points are biased toward the center of said merge conveyor;

alignment conveyor means coupled with said merge conveyor means for receiving packages from said merge conveyor means and biasing each package toward one edge thereof, said alignment conveyor means including longitudinally extending, spaced, parallel, lateral sides and further comprising:

a plurality of longitudinally spaced, coplanar, parallel rollers, said rollers being skewed at an angle relative to a line extending perpendicular to the sides of said alignment conveyor means; and

a longitudinally extending guard rail extending along one lateral side of said alignment conveyor, said rollers converging toward said guard rail in the direction of conveyor movement;

a plurality of destination conveyors; and

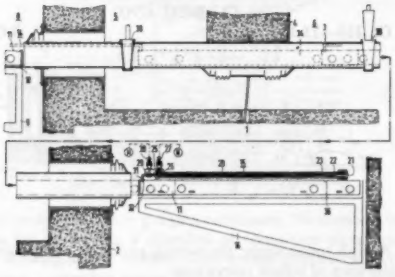
a main discharge conveyor means coupled with said alignment conveyor means, said discharge conveyor means including at longitudinally spaced points adjacent the destination conveyors, a plurality of diverter means for selectively diverting preselected packages to a predetermined one of said destination conveyor.

4,044,898

REACTOR FUEL ASSEMBLY LOCK TRANSPORT

Hans-Peter Schabert; Horst Porner, and Artur Bauer, all of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed July 7, 1975, Ser. No. 593,382
Claims priority, application Germany, July 16, 1974, 2434180
Int. Cl.[2] F23K *3/00*
U.S. Cl. 214—18 N **6 Claims**



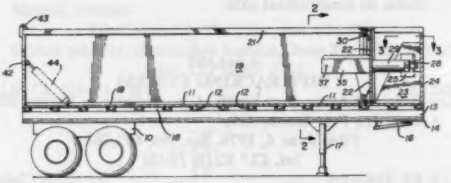
1. A nuclear reactor installation having a containment, a fuel assembly lock extending through the containment, an elongated fuel assembly carriage which is movable lengthwise through the lock, and at least one stationary motor having a drive for moving the carriage; wherein the improvement comprises said drive being formed by a rod that is movable in the lengthwise direction of the carriage, and means for releasably connecting the rod with the carriage, the rod being driven lengthwise by the motor, said means being for connecting the rod with the carriage at two positions spaced apart lengthwise with respect to the carriage.

4,044,899

HORIZONTALLY DISCHARGING SEMI-TRAILER

Howard Booher, Randolph, Ohio, assignor to Robert J. Bruce, New Castle, Pa. and Mark T. Tate, Atwater, Ohio, part interest to each

Filed June 7, 1976, Ser. No. 693,639
Int. Cl.[2] B60D *1/00*
U.S. Cl. 214—82 **7 Claims**



1. In a horizontally discharging semi-trailer having an elongated body with a discharge opening in one end and a movable pusher plate and means for moving the same normally positioned in the opposite end, said elongated body having a smooth floor and smooth inner side walls; said floor comprising a floor plate, a plurality of longitudinally spaced transversely positioned reinforcing members secured to the underside thereof, longitudinally extending frame members secured to the longitudinal sides of said floor plate and reinforcing members, a pair of transversely spaced longitudinally extending beams having notches therein registering with said reinforcing members and secured thereto and to said floor plate and a secondary plate positioned between said beams and secured to the bottoms thereof, the side walls of said elongated body comprising substantially vertically standing wall plates attached to and extending upwardly from said longitudinally extending frame members, rails positioned on the upper longitudinal edges of said wall plates and a plurality of longitudinally spaced vertically standing tapered secondary reinforcing members secured to the outer surfaces of said wall plates and attached at their upper and lower ends to said rails and frame members respectively so that said side walls form rigid truss-like members continuously engaged on and supporting said floor therebetween.

4,044,900

AUTOMOBILE TOWING DEVICE

Richard J. Gaumont; Maurice Leonard Wolfe, both of Los Angeles, and Robert Lee Collins, Culver City, all of Calif., assignors to West Manufacturing & Towing Equipment Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 631,669, Nov. 13, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,610
Int. Cl.[2] B60P *3/12*
U.S. Cl. 214—86 A **5 Claims**

1. In an automobile towing device for towing a vehicle with a tow truck having a boom for lifting and supporting the vehicle and a hydraulic cylinder for driving the boom pivotally upwardly and downwardly wherein the improvement comprises:

a hollow support member,

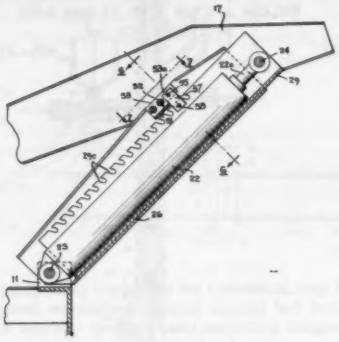
a hollow bracing post slidably mounted within said support member, said cylinder being mounted within said bracing post,

means for pivotally supporting said cylinder and said support member on said tow truck,

means for pivotally attaching the ram of said cylinder and

said bracing post to said boom for pivotal motion about a common pivot axis,

said bracing post being U-shaped and having a plurality of paired canted slots formed along the edges of the opposing walls thereof, and



pawl mechanism means pivotally mounted on said support member for successively engaging the bracing post in pairs of said slots as said bracing post is driven upwardly along the support member, thereby to prevent downward motion of said bracing post when the bracing post is stopped with the pawl mechanism means engaged in a pair of said slots.

4,044,901

GOODS DISCHARGING APPARATUS

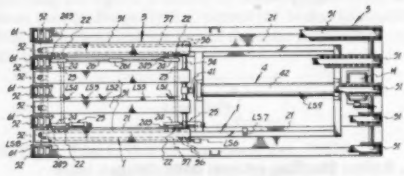
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Apr. 30, 1975, Ser. No. 573,253

Claims priority, application Japan, Dec. 18, 1974, 49-145915

Int. Cl.² B65G *65/02*

U.S. Cl. 214—89 **8 Claims**



1. A goods discharging apparatus comprising a vertically movable platform, means for lifting said movable platform up and down, including a pair of shafts arranged substantially parallel to each other and rotatably supported by bearings disposed in a base frame, two pairs of arms each of which is secured at its middle portion to each end of each of said shafts, with the upper ends of said respective arms being pivotally secured to said movable platform, two piston-cylinder means, each having its cylinder tube pivotally secured to said base frame, with the piston rod of each of said piston-cylinder means being pivotally secured to the lower end of the corresponding one of said arms which are in turn secured to the corresponding ends of said shafts, and a connecting rod pivotally secured at both of its ends to the lower ends of said respective arms which are secured to the other ends of said shafts, a goods support means mounted on said movable platform, said goods support means extending from the movable platform, means mounted on said movable platform for moving said goods support means in the forward and backward directions, conveyor means having a goods conveying surface, said conveyor means being arranged such that said goods support means can be raised up from the goods carrying surface of said conveyor means with the vertical movement of said movable platform, said goods support means also projecting out from the conveyor means at the same time as it projects out from said movable platform, a checking means disposed at the discharge end of said conveyor means so as not to impede the forward or backward movement of said goods support means, said checking means being provided with a pawl portion which is positioned lower than the upper surface of the goods support means when the goods support means is disposed in its raised position and higher than the upper surface of said goods support means when said goods support means is disposed in its lowered position.

4,044,902

AERIAL LIFTING EQUIPMENT

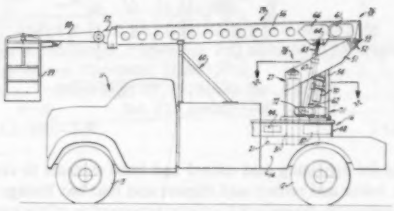
Jay M. Eitel, Atherton, Calif., assignor to General Cable Corporation, San Carlos, Calif.

Continuation of Ser. No. 615,238, Sept. 22, 1975, abandoned.

This application Aug. 23, 1976, Ser. No. 716,553

Int. Cl.² E02F *3/70*

U.S. Cl. 214—132 **8 Claims**



1. In a lifting equipment, a platform, a support structure, means rotatably mounting the support structure upon the platform for rotation about a substantially vertical axis, a boom structure mounted on the support structure for movement about a substantially horizontal axis and drive means mounted upon said platform and said support structure for causing rotation of said support structure about said substantially vertical axis, said drive means including a track structure mounted in a fixed position on the platform, said drive structure having a circular track surface, at least three spaced friction members offset from the vertical axis and adapted to engage the circular track surface, motive means for driving only one of said three friction members, said motive means including a motor having an output shaft and speed reducing gearing connecting the output shaft of the motor to said one friction member, said one friction member being in the form of a wheel assembly having an outer tire, said speed reducing gearing including a gear assembly mounted within the confines of the wheel assembly and means for applying a preload force to said one friction member to yieldably urge said outer tire into engagement with said circular track surface, said means for applying a preload force including means for applying a yieldable force to at least one of said three friction members other than said one friction member to yieldably urge said at least one friction member into engagement with said circular track surface whereby a preload force is applied to said one friction member which is sufficient to permit said boom structure to sustain heavy side loading.

4,044,903

SPECIFIC LINKAGE ARRANGEMENT FOR BUCKET CONTROL

George B. Baron, Marion, Ohio, assignor to Marion Power Shovel Company, Inc., Marion, Ohio

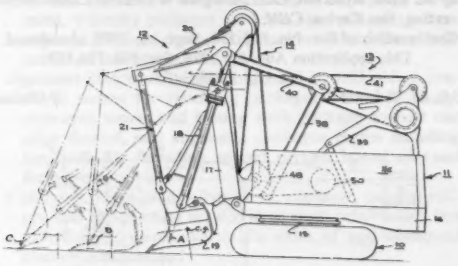
Filed Mar. 19, 1975, Ser. No. 559,963

Int. Cl.² E02F *3/62*

U.S. Cl. 214—138 R **14 Claims**

1. A power shovel comprising a base unit; a support unit rotatably mounted on said base unit; a front end assembly including a stiffleg pivotally connected at a lower end thereof

to said support unit, a dipper handle operatively connected to said stiffleg, a dipper having a forwardly disposed digging end pivotally connected to said dipper handle, said dipper being biased to pitch the forwardly disposed digging end thereof upwardly, means for limiting the upward pitch of the digging end of said dipper relative to said dipper handle, a hoist frame pivotally connected to said stiffleg, and a hoist link pivotally connected at the ends thereof to said hoist frame and said dipper, said dipper handle, hoist link and hoist frame defining a four bar linkage; a crowd system operatively interconnecting said support unit and said front end assembly; a hoist system operatively interconnecting said support unit and said front end assembly; and control means mounted on said support



means for operating said crowd and hoist systems to crowd, hoist, lower and retract said dipper, said four bar linkage having a geometry wherein the point of intersection of the longitudinal centerlines of said hoist link and said dipper handle is confined to the lower and forwardly disposed quadrant of a set of coordinates having the center of gravity of the dipper defining the origin of the set of coordinates, said coordinates being parallel and perpendicular to a longitudinal centerline of said dipper and said quadrant thereof including said forwardly disposed digging end of said dipper, and said point of intersection is positioned inwardly of the bottom surface of said dipper when said dipper is in a retracted position, pitched upwardly and restrained by said pitch limiting means.

4,044,904

METHOD OF FEEDING PARTICLES FROM A FIRST REGION TO A SECOND REGION

Harold E. Trumbull, and Dean F. Poeth, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Aug. 25, 1975, Ser. No. 607,203
Int. Cl.² B65G 65/30
U.S. Cl. 214—152 **3 Claims**

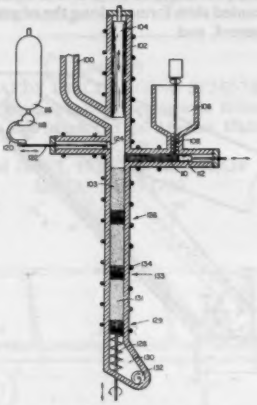
1. A method of feeding a material comprising solid particles from a first region at a first pressure to a second region at a substantially different second pressure, comprising

conveying the material from the first region into an elongate tube connected to communicate between the first region and the second region,

providing a plurality of movable sealing zones in the tube, each sealing zone comprising a mixture of solid particles and an added liquid contacting the inner wall of the tube, to provide a substantially fluid-tight seal between the second region and at least a substantial portion of the tube communicating with the first region while the material is being conveyed from the first region into the tube,

forcing the material and sealing zones through the tube toward the second region, and

conveying the material, and at least one of the sealing zones, from the tube into the second region by boring into the at



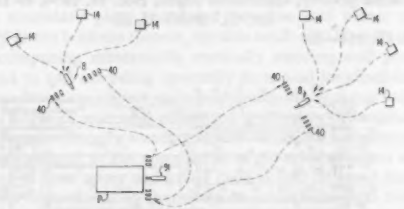
least one sealing zone and the material with an auger and then retracting the auger into the second region.

4,044,905

METHODS AND APPARATUS FOR TRANSFERRING REFUSE

Harvey W. Liberman, Knoxville, and John C. Salyers, Oak Ridge, both of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,757
Int. Cl.² B65G 67/20
U.S. Cl. 214—152 **5 Claims**



1. Refuse handling process comprising:

depositing a container on a carriage;

aligning the forward end of the container with the discharge opening of a packer assembly;

displacing said carriage toward said packer assembly, said container having a movable wall situated near a forward end thereof, said wall being movable away from said forward end;

packing refuse from said packer assembly through said forward end into said container while progressively displacing said movable wall rearwardly under the urgings of oncoming refuse;

subsequently displacing said container from said packer assembly, placing said container on a support at an unloading site, and aligning said movable wall with an extendable-retractable power ejector means mounted on said support;

extending said ejector means toward said container wall so that said ejector contacts and pushes said movable wall forwarding toward said end, thereby discharging refuse from the container through said forward end;

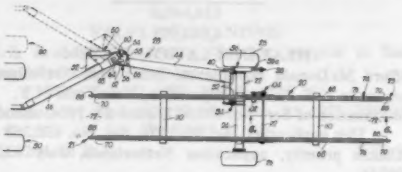
retracting said ejector, leaving said movable wall in a forward position; and

transporting said container to a loading site.

4,044,906
MULTIPLE ROUND BALE MOVER

Thomas Gene Schrag; Merle Keith Burkhart, and Harold Keith Garrison, all of Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 11, 1975, Ser. No. 603,359
Int. Cl.[2] B60P 1/16
U.S. Cl. 214—506 18 Claims

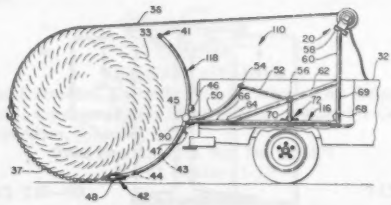


1. In a transporting implement for cylindrical crop bales:
an elongated, normally horizontal support bed including a pair of laterally spaced beams extending longitudinally between opposite ends of the bed and terminating in outermost tips;
a continuous, flexible conveying element having an uppermost stretch extending along the top surface of each of said beams respectively;
means for selectively tilting the bed in either of two opposite directions about a transverse, horizontal axis to place a selected end of the bed close to the ground for loading;
a transverse stub shaft at each of the four tips of the beams, respectively,
the two stub shafts at each end of the bed being axially aligned but physically spaced apart in accordance with the distance between the two beams;
a guide associated with each stub shaft, respectively, and supported for rotation about the axis of the stub shaft to entrain the corresponding element; and
reversible means for driving said elements in unison along the bed in either of two opposite directions,
said bed at both of its opposite ends being devoid of structure spanning the beams whereby to define unobstructed areas from the tips inwardly that permit the beams to straddle a bale during endwise loading of the same from either end of the bed.

4,044,907
HAY HANDLER

Carl R. Craft, Rte. 1, Box 15, Kempner, Tex. 76539

Filed Apr. 26, 1976, Ser. No. 680,158
Int. Cl.[2] B60P 1/04
U.S. Cl. 214—506 14 Claims

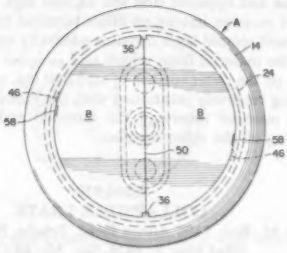


1. Hay loading and transporting apparatus comprising a main frame having opposed sides, a forward end, and a trailing end;
a cradle in the form of an upwardly opening, elongated, segment of a cylinder having an open framework and providing a leading edge spaced from a rear edge and opposed end members;
a winch, a cable means, means by which one end of said cable is attachable to said rear edge, with the remaining marginal cable end being rove about said winch such that the cable is extensible from and movable towards said winch, means mounting said winch in proximity of said forward end of said main frame;
mount means affixed to said main frame for pivotally supporting said cradle at an off-center location underlying said cradle, said mount means moves said cradle from a retracted position closely adjacent said main frame into an extended position spaced from said main frame with an over-the-center movement to thereby enable said cradle to be extended away from said main frame and pivoted into a position to place a marginal rear edge portion of the cradle at ground level, and the main frame thereafter moved in a direction towards said rear edge in order to engage a bale of hay with said rear edge, a marginal length of said cable can then be forced under the bale, whereupon the cable is then tightened to move the bale of hay into the cradle and thereafter pivotally move the cradle into the retracted position, thereby loading the bale and enabling the bale to be transported to another geographical location.

4,044,908
COVER FOR ELECTRICAL FLOOR BOXES

George R. Dauberger, Pittsburgh, Pa., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 31, 1975, Ser. No. 645,683
Int. Cl.[2] H02G 3/08
U.S. Cl. 220—3.8 7 Claims



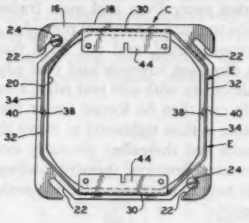
1. A support member having an opening therein, said opening having an outer peripheral edge, a shoulder spaced inwardly from said opening peripheral edge, and an opening peripheral wall extending between said shoulder and said opening peripheral edge, a two-piece cover received in said opening and having outer and under surfaces, the outer peripheral portion of said undersurface being supported on said shoulder, said cover having a cover peripheral wall facing said opening peripheral wall, said cover being formed of two generally flat members having mating walls extending across said opening to define a joining line, said cover peripheral wall having detents extending outwardly therefrom on opposite sides of said joining line, said opening peripheral wall having recesses releasably receiving said detents, said flat members having rabbets in said outer surface at the opposite ends of said joining line, and inwardly extending abutments on said opening peripheral wall received in said rabbets.

6. A half part cooperable with a like half part to form a cover for an opening in a support member or the like comprising; a generally flat member having outer and under surfaces and generally opposite corners, a mating wall extending generally across said corners for mating with a like mating wall on a like flat member, a peripheral wall extending around said flat member generally between said corners, tab means extending outwardly from said peripheral wall intermediate said corners for reception in a recess to releasably lock said flat member in an opening, and a rabbet in said outer surface adjacent at least one of said corners for receiving a projection to aid in releasably locking said flat member in an opening.

4,044,909
TILE WALL COVER

David C. Amsler, Pittsburgh, and William E. Wagner, Elizabeth, both of Pa., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 15, 1976, Ser. No. 741,728
Int. Cl.[2] H02G 3/12
U.S. Cl. 220—3.8 6 Claims

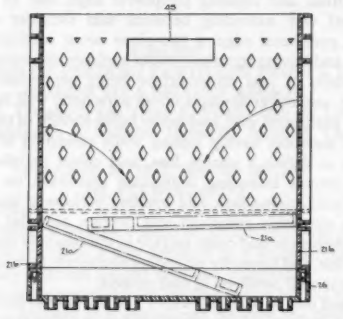


1. In a tile wall cover for electrical outlet boxes including a substantially flat plate having mounting means adjacent the outer periphery thereof for mounting same to an electrical outlet box and having a large opening therethrough inwardly of said mounting means, and a ringlike extension welded to said plate in surrounding relationship to said opening, the improvement comprising; said extension being formed from a pair of substantially identical generally U-shaped members each having a base and opposite first and second legs, said first leg on each said member having an offset terminal end portion offset toward said second leg a distance generally equal to the thickness of the material from which said member is made to form a rabbet on the outer surface of said first leg, said pair of members being reversely positioned with the rabbet on the first leg of each member receiving the terminal end portion of the second leg on the other member.

4,044,910
COLLAPSIBLE CRATE

Theodor M. Box, 1108 Aileen Road, Brielle, N.J. 08730

Filed May 5, 1976, Ser. No. 683,390
Int. Cl.[2] B65D 7/24, 9/14
U.S. Cl. 220—7 7 Claims

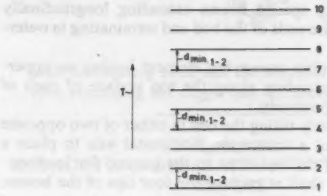


1. A collapsible shipping crate comprising a base portion having vertical flanges extending from its outer edges, two inwardly folding side wall members and two inwardly folding end wall members, said wall members being attached to the respective upper edge portions of said vertical flanges, said wall members each having a hinge dividing the wall members into an upper and lower portion, the lower portions of said end wall members extending to a greater height than the lower portion of said wall members such that the upper end wall members fold and overlie the upper side wall members when the crate is in its collapsed position and a plurality of stops and latches located on the vertical edges of the upper wall portions for locking the wall members in an upright position when assembled, said wall members each having a plurality of plug means depending from the lower edges thereof, and respective complementary socket members in the upper edge portion of said vertical flanges receiving said plug means to affix said walls to said flanges.

4,044,911
HEAT INSULATION SYSTEM

Clifford McDonald Hargreaves, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 483,612, June 27, 1974, abandoned.
This application Jan. 19, 1976, Ser. No. 650,368
Claims priority, application Netherlands, July 13, 1973, 7309766
Int. Cl.[2] F16L 59/08; F17C 3/08
U.S. Cl. 220—9 LG 3 Claims

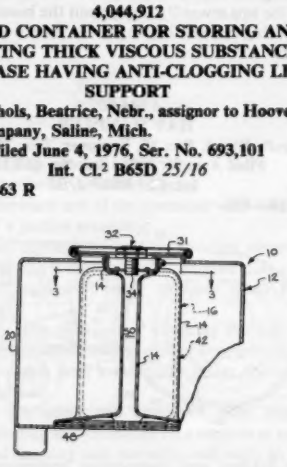


1. In a heat insulation system suitable for cryogenic apparatus and including a plurality of spaced layers of a radiation-reflecting material, the improvement comprising the spacing apart of each two adjacent layers having facing surfaces by a distance d_{min} which satisfies the relationship: $d_{min} = (0.1/T)$, where d_{min} is expressed in cm. and T = the mean operational temperature of the two layers expressed in ° K.

4,044,912
LINED CONTAINER FOR STORING AND TRANSPORTING THICK VISCOUS SUBSTANCES SUCH AS GREASE HAVING ANTI-CLOGGING LINER SUPPORT

Dwight E. Nichols, Beatrice, Nebr., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed June 4, 1976, Ser. No. 693,101
Int. Cl.[2] B65D 25/16
U.S. Cl. 220—63 R 5 Claims



1. In a container for storing and transporting material, an upright collapsible bag having a single opening at the upper end thereof, and a spacer assembly disposed inside said bag and aligned with said opening, said spacer assembly comprising a central hub member and a plurality of spaced apart frame members radiating outwardly from said hub member, said hub member being annular in shape and being secured to said frame members at the upper ends thereof, said hub member being

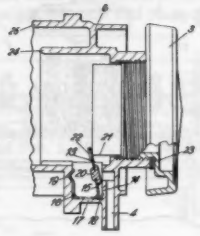
disposed within the open upper end of said bag member, means securing said hub member in fluid tight relation to said upper end of said bag member, each of said frame members being of generally C-shape so that each has a main upright portion and laterally extending end portions, the end portions at the upper ends of said frame members being secured to said hub members, and a base member secured to the end portions at the lower ends of said frame members.

4,044,913

VALVE MECHANISMS

Stig Erik Brunnert, Vanersborg, Sweden, assignor to Saab-Scania AB, Sodertalje, Sweden

Filed Feb. 19, 1976, Ser. No. 659,341
Claims priority, application Sweden, Feb. 21, 1975, 7501957
Int. Cl.² B65D *25/00*
U.S. Cl. 220—86 R **8 Claims**



1. In a container for holding a liquid, a filling pipe having an inlet which is closable by a removable cap and an outlet disposed in said container, at least one air-ventilating line which opens into an internal recess defined in the inner surface of the filling pipe adjacent the filling pipe inlet end, and a valve mechanism for said air-ventilating line, the improvement which comprises, said recess being of parallelepipedic configuration and extending transversely of said filling pipe with said air-ventilating line opening in an axial wall of said recess, a spring comprising a double-bent U-shaped plate spring having two legs and a web portion connecting said legs mounted in said filling pipe and tensioned against the walls of said recess so that its legs are spaced apart in the longitudinal direction of said filling pipe, said plate spring having a part thereof extending into the through-passage of said filling pipe, a seal carried by said plate spring and arranged to close the connection to the air-ventilating line, and an axial sleeve extension provided on said cap arranged, when said cap is mounted on said filling pipe, to engage and urge said plate spring, via its extension, in a manner to cause the connection to the airventilating line to be opened.

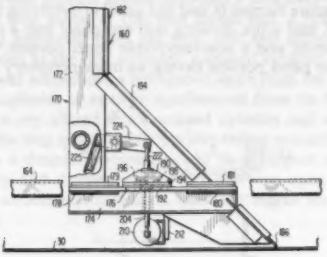
4,044,914

REFUSE CONTAINER

Donald J. Hopkins, Knoxville; John C. Salyers, Oak Ridge, and Paul L. Goranson, Knoxville, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,371
Int. Cl.² B65D *25/10*
U.S. Cl. 220—93 **7 Claims**

1. A transportable refuse container comprising:
walls defining a tubular body having a pair of ends;
slideable bulkhead means within the body and displaceable between the pair of ends;
end closure means hingedly connected to one end of the body, openable for container unloading, and having an opening for filling the container;
the other end of the body having an opening operable to receive means for advancing the bulkhead means; and
frictional resistance means carried by the bulkhead means, operable to frictionally resist movement of the bulkhead means relative to the container, and releasable during movement of the bulkhead means toward the end closure



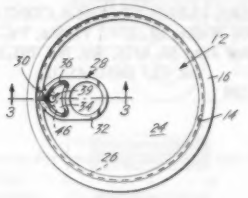
means so that the force necessary to advance the bulkhead means is minimized.

4,044,915

CONTAINER END CLOSURE

Leonard Thomas LaCroce, Paramus, and Charles Stephan Radtke, Little Ferry, both of N.J., assignors to American Can Company, Greenwich, Conn.

Filed July 22, 1976, Ser. No. 707,533
Int. Cl.² B65D *41/32*
U.S. Cl. 220—270 **10 Claims**



1. A container end closure comprising: a wall having an at least partially removable panel defined therein by a rupturable primary score, said panel having formed therein at least a portion of a double-folded band adjacent said primary score; an opening tab having a nose portion at one end and a handle portion at its other end; means for securing said tab, intermediate said end portions thereof, to the outer surface of said panel, so that said nose portion is disposed adjacent said primary score and said band portion; and a hinge section defined in said panel by a rupturable, generally U-shaped ancillary score, the loop portion of said ancillary score being disposed about said securing means with its two leg portions having end regions presented toward and terminating adjacent said band portion and said nose portion of said tab, so that lifting of said handle portion of said tab is operative to rupture said ancillary score through a region terminated by said band and elevate said hinge section while forcing said nose portion thereof downwardly to initiate rupture of said primary score, subsequent rearward force on said tab causing further rupture of said primary score to effect at least partial removal of said panel.

4,044,916

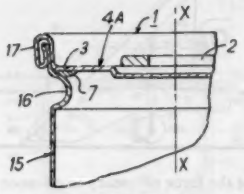
CONTAINERS HAVING PROTECTIVE OPENING EDGES

John Beveridge, Uxbridge, England, assignor to Metal Box Limited, England

Filed Dec. 23, 1975, Ser. No. 643,649
Int. Cl.² B65D *41/32*
U.S. Cl. 220—270 **5 Claims**

2. An easy opening container comprising a tubular body and a closure secured to one end of said body by a seam, said

closure including an end panel, said body having a circumferentially disposed continuous bead inwardly directed and underlying said end panel in closely spaced relation thereto, said closure being of the easy opening type and including a circumferential score formed in said end panel in overlying relation to said bead, said score dividing said end panel into a removable panel portion and a non-removable panel portion, said non-removable panel portion having an inner periphery overlying



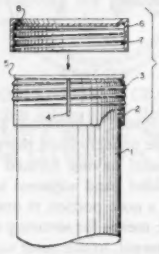
said bead, and a band bonded to said removable panel portion and extending across said score and overlapping said non-removable panel portion, at least a portion of said band being disposed between said bead and said non-removable panel portion, said band being arranged to mask the edge of said removable panel portion and said bead being arranged to mask the edge of the non-removable panel portion when said removable panel portion is removed.

4,044,917

CLOSURE ELEMENT FOR A CONTAINER

James Vella, 504 Walker St., SW., Vienna, Va. 22180

Filed June 30, 1976, Ser. No. 701,205
Int. Cl.[2] B65D *45/32*
U.S. Cl. 220—288 9 Claims



1. A stretchable, externally-threaded collar member which is adapted to cooperate with an internally-threaded cap member to form a closure for a container, said threaded collar member containing at least one slot which extends for a distance from one open end thereof, the stretchable nature of said threaded collar and the presence of said slot enabling said threaded collar to be mounted over a top lip of the container and positioned around the neck of said container beneath said lip.

4,044,918

HIGH TEMPERATURE, QUICK ACCESS DOOR FOR HIGH VACUUM CHAMBERS

Lynn J. Alton, Boulder Creek, Calif., assignor to Huntington Mechanical Laboratories, Inc., Mountain View, Calif.

Filed June 16, 1975, Ser. No. 586,961
Int. Cl.[2] B65D *45/28*
U.S. Cl. 220—314 9 Claims

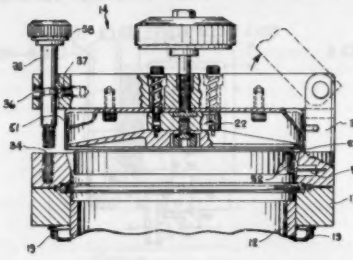
3. A high temperature, quick access door for a high vacuum chamber and the like comprising:

a rim circumscribing with a bakeable metal sealing surface an opening into a high vacuum chamber to be closed;

a sealing disc for closing said opening having a bakeable metal peripheral sealing edge shaped to hermetically mate conformably with said bakeable sealing surface of said rim with a hermetic fit sufficient to separate a vacuum of 10^{-6} torr within said chamber from atmospheric pressure;

a support arm for said disc selectively securable across said opening to support said disc in front of said opening in position for registry therewith;

means mounting said sealing disc on said support arm for selective movement between a registering position in which said sealing disc closes said opening with its sealing edge hermetically engaging said sealing surface and a retracted position in which said disc is spaced from said opening and its sealing edge is hermetically disengaged from said sealing surface, said mounting means including drive means for applying force centrally to said disc when it is in said registering position to hermetically engage said



sealing edge of said disc with said sealing surface of said rim, the skirt of said disc providing said sealing edge being generally a right circular section of a cone tapering inwardly away from said opening when it is supported by said support arm in front of said opening, whereby upon said drive means applying said force to said disc it applies axial compression of said disc into said opening to generate peripheral expansion of said disc in the plane of said opening and hermetically engage said sealing edge and said sealing surface with high vacuum sealing pressure, and wherein the thickness of a circumferential skirt portion of said sealing disc decreases radially outward of said disc toward said sealing edge to provide said skirt portion with increasing flexibility toward said sealing edge for accommodating hermetic sealing engagement of said edge with said conical sealing surface under the action of said drive means.

4,044,919

THERMOPLASTIC BAG DISPENSING ASSEMBLY

Robert H. Olson, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 552,076, Feb. 24, 1975, abandoned. This application Sept. 2, 1975, Ser. No. 609,269
Int. Cl.[2] B65D *85/67*
U.S. Cl. 221—63 4 Claims

1. A thermoplastic bag dispenser assembly comprising a dispenser carton containing a plurality of thermoplastic bags mounted on and folded about a resilient insert member, said bags having an open mouth and a closed bottom said closed bottom portions being folded underneath said insert member and said open mouth portions resting on the upper surface of said insert member, said carton comprising coextensive bottom, top, front and rear walls and an end wall at each opposed end of the carton, said top and front walls having a longitudinally extending tear strip defined by a pattern of perforations which extend in an oval-like configuration around a common longitudinal edge of the carton top and front wall, said thermoplastic bags being characterized by having transversely extending, spaced-apart and substantially parallel ribs, said ribs being solid, continuous and formed as an integral part of said thermo-

plastic bag, and said bags being positioned on said resilient insert member so that, upon removal of said tear strip from said

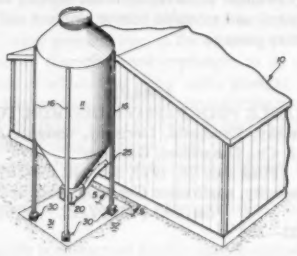
carton thereby forming a bag dispensing orifice, individual bags are dispensed from said carton with the open mouth of said bag in an upright position and ready for loading.

4,044,920

LOAD CELL AND CONTROL FOR BULK BIN

Ray E. Swartzendruber, Syracuse, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Feb. 2, 1976, Ser. No. 654,165
Int. Cl.² B67D 5/08; G01G 3/14; G01L 5/12
U.S. Cl. 222—58 **28 Claims**



1. A load cell for measuring the weight of a feed container bin and any feed contained therein, the combined weights acting in a given direction, comprising slug means aligned in a predetermined direction and capable of being deformably strained in response to the weight of the bin and any feed applied to the load cell, transducer means connected to the slug means and having an electrical characteristic corresponding to the strain caused to the slug means, and support means for maintaining the slug means in a predetermined orientation relative to the direction in which the weight forces of the container bin and any feed contained therein are applied to the load cell, said support means including a foot adapted to support said slug means at one slug means end, a first cylinder extending upwardly from the foot, first and second annular disks affixed to the first cylinder, a second cylinder affixed to the first and second disks but spaced apart from the slug, foot and first cylinder so as to be cantilevered from the first cylinder, and a cap affixed to the second cylinder and adapted to engage the slug means at an opposite end to maintain the slug means in a desired orientation, and including a cap disk affixed to the second cylinder, and a cap plug carried by the cap disk for engaging the slug means and adjustable through a range of positions relative to the cap disk.

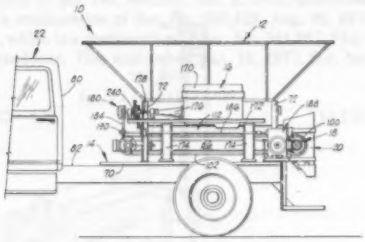
3. A load cell for measuring the weight of a feed container bin and any feed contained therein, the combined weights acting in a given direction, comprising slug means aligned in a predetermined direction and capable of being deformably strained in response to the weight of the bin and any feed applied to the load cell, transducer means connected to the slug means and having an electrical characteristic corresponding to the strain caused to the slug means, and support means for maintaining the slug means in a predetermined orientation relative to the direction in which the weight forces of the contained bin and any feed contained therein are applied to the load cell, said support means including a foot adapted to support said slug means at one slug means end, a first cylinder extending upwardly from the foot, first and second annular disks affixed to the first cylinder, a second cylinder affixed to the first and second disks but spaced apart from the slug, foot and first cylinder so as to be cantilevered from the first cylinder, and a cap affixed to the second cylinder and adapted to engage this slug means at an opposite end to maintain the slug means in a desired orientation, and jack support means for selectively and directly supporting said cap upon said first cylinder to release strain upon said slug means for load cell servicing.

4,044,921

SAND BAG FILLING APPARATUS

Warren R. Caverly, 900 S. Beard, Shawnee, Okla. 74801

Filed Apr. 12, 1976, Ser. No. 675,800
Int. Cl.² B67D 5/12
U.S. Cl. 222—74 **10 Claims**



1. An apparatus for receiving bulk sand and for bagging the sand, comprising:

a frame assembly;

a hopper assembly supported by the frame assembly and comprising a hopper having a discharge opening, the hopper assembly being further characterized as comprising agitating means for imparting lifting energy to the sand contained in the hopper, the agitating means being characterized as comprising:

a first longitudinal member journally supported in the hopper;

a plurality of radially extending arm members connected to the first longitudinal member in a spatial pattern wherein the sand is caused to be fluffed by the arm member as the longitudinal member is rotated;

a second longitudinal member journally supported in the hopper in generally parallel relationship to the first longitudinal member;

a plurality of radially extending arm members connected to the second longitudinal member in a spatial pattern wherein the sand is caused to be fluffed by the arm members as the second longitudinal member is rotated, the arm members of the second longitudinal member meshingly cooperating with the arm members of the first longitudinal member;

a third longitudinal member journally supported in the hopper in generally parallel relationship to the first longitudinal member and the second longitudinal member;

a plurality of radially extending arm members connected to the third longitudinal member in a spatial pattern wherein the sand is caused to be fluffed by the arm members as the third longitudinal member is rotated, the arm members of the third longitudinal member meshingly cooperating with the arm members of the

first longitudinal member and the second longitudinal member; and

rotating means for rotating the first longitudinal member, the second longitudinal member, and the third longitudinal member;

a conveyor assembly supported by the frame assembly comprising a conveyor belt disposed spatially in sand receiving relationship to the discharge opening;

power means connected to the conveyor assembly for selectively powering the conveyor belt in an actuated mode;

a bag chute supported by the frame assembly and disposed spatially in sand receiving relationship to the conveyor belt; and

actuating means for selectively actuating the power means to transmit driving power to the conveyor belt.

4,044,922

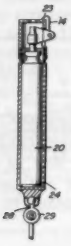
PROTECTIVE DEVICE

Lewis O. Bordelon, 300 Dulles St., Lafayette, La. 70501

Filed May 25, 1976, Ser. No. 689,866

Int. Cl.² B65D *83/14;* B05B *15/06*

U.S. Cl. 222—183 **10 Claims**



1. An anti-personnel spray container having article retaining means, said container comprising a case having a cap removably fastened to the body of the case, a replaceable aerosol cartridge containing a fluid immobilizing agent under pressure enclosed in the main body of the case, said cartridge having a nozzle with a central opening therein, said nozzle extending into the cap, the cap having a central opening on the end thereof in alignment with the opening of the nozzle, mechanism within the container to effectuate release of the fluid under pressure, and pivotally mounted hook means associated with said mechanism and extending to the outside of the cap which acts both as a safety latch to prevent release of fluid under pressure and alternately as a push button to trigger the mechanism to release the fluid under pressure.

4,044,923

FOAM GENERATING DISPENSER HAVING A MOVABLE AND STATIONARY POROUS ELEMENT

Jack C. Gardner, College Park, Ga., assignor to Glasrock Products, Inc., Fairburn, Ga.

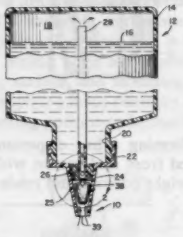
Filed May 19, 1976, Ser. No. 687,762

Int. Cl.² B65D *37/00;* B67D *5/58*

U.S. Cl. 222—190 **11 Claims**

1. In a low pressure foam generating and dispensing device having a receptacle for containing foamable liquid and air, a nozzle near one vertical extremity of the receptacle and having internal surfaces to define a discharge passageway open at one end to the receptacle interior and to a foam discharging opening at its other end, at least a portion of the discharge passageway being defined by an outwardly converging frusto-conical interior surface, a mixing subassembly connected to the one end of the discharge passageway and having an imperforate tube extending to and opening near the other vertical extremity of the receptacle, and a one-way air return passage operative to pass air into the receptacle upon a reduction of pressure within the receptacle to below atmospheric pressure, the improvement comprising:

a movable form sustaining porous element positioned in the discharge passageway between the mixing subassembly a frusto-conical portion of the discharge passageway, said movable porous element being larger than the small end of the frusto-conical portion and smaller than the transverse area of the discharge passageway at the mixing subassembly, whereby said movable porous element moves against the internal frusto-conical surfaces of the nozzle upon discharge of a foamable liquid and air mixture from the receptacle to cause passage of the discharged mixture through the movable porous element and whereby the movable porous element moves toward the mixing subassembly to allow air to return to the interior of the receptacle around said movable porous element and through the air return passage.



4,044,924

ADJUSTABLE PROGRESSIVE DISTRIBUTOR VALVE

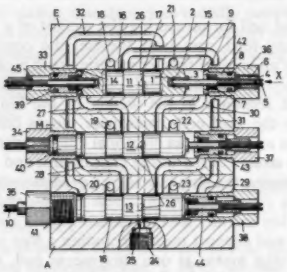
Horst Saretzky, Ennepetal, Germany, assignor to De Limon Fluhme & Co., Dusseldorf, Germany

Filed July 28, 1975, Ser. No. 599,587

Claims priority, application Germany, Aug. 3, 1974, 2437473

Int. Cl.² F01M *1/02*

U.S. Cl. 222—250 **10 Claims**



1. An adjustable progressive distributor valve for the intermittent metered distribution of a flowable medium, for example a lubricant, to a plurality of separate destination points, in accordance with an automatic cycling operation of the valve which is generated by said medium as it enters the valve under pressure, the distributor valve comprising in combination:

a valve block having arranged therein a plurality of main bores;

a corresponding number of free valve plungers received in the main bores of the valve block for reciprocating movement therein;

an intake channel in the valve block with an intake branch line opening into each main bore for the supply of pressurized medium to each valve plunger;

a pair of metering chambers defined in part by each main bore and in part by the two extremities of the associated

valve plunger, whereby an axial movement of said plunger simultaneously diminishes the volume of one chamber and increases that of the other chamber;

means for abutting each valve plunger axially in both directions, so as to determine two fixed end positions of the stroke over which each valve plunger reciprocates;

a pair of pressure lines leading from axially spaced openings in the main bore of one valve plunger to the two metering chambers of another valve plunger;

a pair of discharge branch lines leading from axially space openings in the main bore of each valve plunger to the outside of the valve block; and

means for individually adjusting the displacement volume of each valve plunger extremity with respect to the associated metering chamber independently of said fixed plunger stroke; and wherein

each valve plunger has at least two flow grooves in its midportion, and the axial locations of the intake branch line, pressure lines, and discharge branch lines opening into the associated main bore are so coordinated with the flanks of said flow grooves that said valve plunger, arriving in a stroke end position, connects one of the two associated pressure lines with the intake branch line and the other pressure line with a discharge branch line, reversing said connections when arriving in the opposite stroke end position, thereby controlling the admission of the pressurized medium into one of the metering chambers of said other valve plunger via one pressure line, and the discharge of the medium from the opposite metering chamber via the other pressure line, as the entering pressurized medium moves that other valve plunger to its opposite end position, in which that other valve plunger, in turn, establishes the pressure line connections for the movement of the next-following valve plunger, as part of a continuing automatic cycling operation; and

the displacement volume adjusting means includes, for each metering chamber:

a metering plunger of smaller diameter than the valve plunger;

a matching guide bore located axially outside and adjoining the metering chamber, so that the metering plunger, when received therein, defines with its axially inwardly oriented extremity a portion of the metering chamber; and

an adjustable drag connection between the valve plunger and the metering plunger, including means for adjusting the length of the drag stroke of the metering plunger over which the latter moves in unison with the valve plunger, thereby acting as a differential piston in cooperation with the latter; an increase in the length of said drag stroke thus resulting in a decrease in the effective volume of the metering chamber.

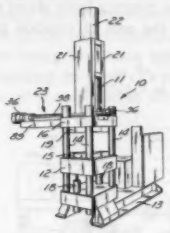
4,044,925

SCREW FEEDER FOR INJECTION MOLDING MACHINE

James R. Mercer, Akron, Ohio, assignor to McDowell-Wellman Engineering Co., Cleveland, Ohio

Filed Apr. 16, 1976, Ser. No. 677,520
Int. Cl.[2] B29B *5/06*
U.S. Cl. 222—263 **10 Claims**

1. In an injection molding machine having a frame, a charging cylinder mounted on the frame including an internal charging chamber and an inlet port on the cylinder communicating with the charging chamber, the combination of a material stock feeder adapted to supply plasticized material to the charging chamber inlet, power actuator means for selectively moving an outlet of the material stock feeder into communication with the inlet of the charging chamber and alternately away from the inlet to automatically afford access to both the outlet and inlet, said power actuator means being constructed and arranged to develop fluidtight communication between



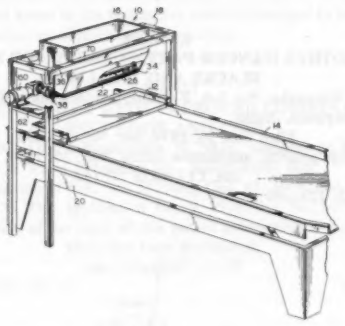
said outlet and inlet while avoiding substantial unbalanced loading on the charging cylinder.

4,044,926

GRANULAR METERING

Kenneth M. Allen, P.O. Box 352, Newberg, Oreg. 97132

Continuation of Ser. No. 646,256, Jan. 2, 1976, abandoned, which is a continuation of Ser. No. 500,313, Aug. 26, 1974, abandoned, which is a continuation of Ser. No. 361,857, May 21, 1973, abandoned. This application Jan. 10, 1977, Ser. No. 757,897
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—409 **13 Claims**



1. In a metering device,

a hopper having a bottom having a tapped bore,

a vertical nipple screwed into the bore,

a locking nut on the nipple for holding the nipple in adjusted position relative to the hopper,

a receiving plate movable below the nipple and serving to support granular material dispersed through the nipple except when the plate is moved across the nipple,

and a movable abrading member above the nipple and extending across the upper end of the nipple in a position such as to block flow of lumps of the granular material through the nipple.

4,044,927

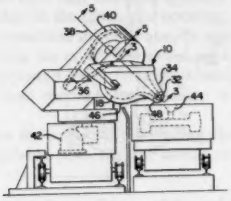
LADLE WITH AXIS OF ROTATION THROUGH DISCHARGE SPOUT

William Wayne Seaton, Dexter, Mich., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 7, 1976, Ser. No. 730,405
Int. Cl.[2] B22D *37/00*
U.S. Cl. 222—604 **6 Claims**

1. A pouring ladle for pouring molten metal into molds or other containers, including wall means forming a chamber for holding the molten metal, a spout having wall means forming

longitudinal passage means therein, the passage means having an inlet end in fluid communication with the chamber, and an outlet end through which molten metal can be discharged, means for rotating the pouring ladle about an axis of rotation, positioned such that the axis of rotation passes through the



center of the discharge end of the passage means, and the pouring ladle and spout being constructed such that lower outer surface of the wall means forming the chamber and the lower outer surface of the wall means of the spout lie in the same horizontal plane when the ladle is in its full, non-pouring position.

4,044,928

CLOTHES HANGER PARTICULARLY FOR SKIRT, SLACKS AND THE LIKE

Kenji Watanabe, No. 3-6, 3-chome, Midorigaoka, Kokurakita, Kitakyushu, Japan

Filed Jan. 14, 1976, Ser. No. 648,896
Claims priority, application Japan, Apr. 26, 1975, 50-57294
Int. Cl.[2] A47J *51/142*
U.S. Cl. 223—96 **3 Claims**

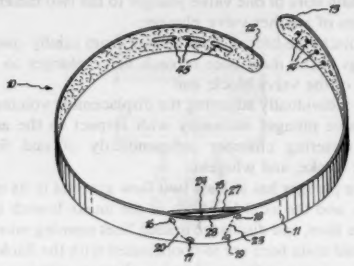
1. A clip type clothes hanger comprising a substantially U-shaped main body having a curved central web portion and a downwardly extending first and second leg portion on respective sides of said central web portion, each leg portion having a closed gripping claw formation adjacent the lower end thereof, a first and a second lug connected to respective sides of respective said first and second leg portions and extending beyond said curved web portion upwardly on each side thereof, a projection on each said first and second lugs extending toward the respective other one of said lugs, said curved portion of said main body having a slot therein, and a U-shaped spring having a central spring web portion disposed in the slot of said main body curved portion and a spring leg portion on each side extending away from said curved portion toward a respective first and second lug and engaged with the respective projection thereon, said lugs being movable together against the biasing force of said spring to open said first and second legs.

4,044,929

HOLSTER BELT

Albert P. Caruso, 147 Broadmoor Drive, Tonawanda, N.Y. 14150

Filed Oct. 30, 1973, Ser. No. 411,035
Int. Cl.[2] F41C *33/02*
U.S. Cl. 224—2 B **13 Claims**



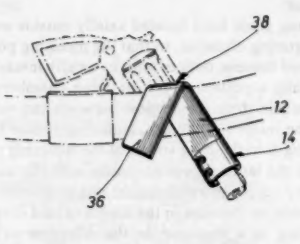
1. A combined holster belt construction for a side arm comprising an elongated belt member for encircling the waist of a wearer in a horizontal direction, band means, and spaced attaching means for securing laterally spaced portions of said band means to said belt member to define a loop therewith which is open at the top and bottom, said spaced attaching means effectively converging generally downwardly relative to each other to aid in retaining said side arm in position in said loop.

4,044,930

HAND GUN HOLSTER

Daniel J. Petroski, 2130 Campbell Road, Houston, Tex. 77055

Filed May 19, 1975, Ser. No. 578,521
Int. Cl.[2] F41C *33/00*
U.S. Cl. 224—2 C **6 Claims**



1. A variously adjustable holster for carrying a hand gun between a waistband of a pair of trousers and the wearer thereof, said holster comprising:

a hand gun barrel-receiving loop for supporting a handgun in a position beneath the waistband of a user at a selected distance from the waistband and and a selected angle in relation thereto;

adjustment means for providing distance and angular adjustment of said loop in relation to the waistband, said adjustment means comprising:

a substantially smooth strap for supporting said loop;

a metal plate internally disposed within said strap and cooperable therewith over substantially an entire length thereof;

said adjustment means being selectively manually bendable into a generally downwardly depending U-shaped hook operable to engage a belt or waistband, said hook comprising:

a first portion comprising a first length of said strap extending between said loop and a bend in said strap; and

a second portion comprising a second length of said strap

extending from the bend in said strap to an end of said strap opposite said loop;

the length of said first and said second portions being variable to position said loop at a selected distance in relation to the waistband;

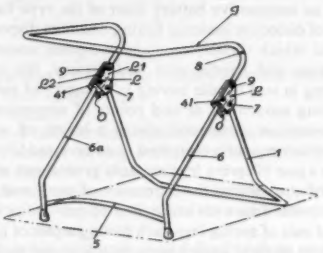
the alignment of said first and said second portions being variable to position said loop at a selected angle in relation to the waistband, the selected angle ranging from a forward slanting position to a rearward slanting position.

4,044,931

TUBULAR BACK SUPPORTED CHILD CARRIER

Pietro Catelli, Via Vittorio Emanuele, 112, Como, Italy (24100)

Filed Feb. 3, 1975, Ser. No. 546,668
Claims priority, application Italy, July 16, 1974, 25210/74
Int. Cl.² A45F *3/08*; A47D *1/02*
U.S. Cl. 224—6 **1 Claim**



1. A tubular back supported child carrier comprising in combination for each side of the carrier a resilient connection box made of plastics material and including two symmetric flanges, two tubular legs firmly fastened by and located between the said two symmetric flanges of the said box, an upper and a lower U-profiled tubular frame pivotally mounted between the said flanges of the said box so as to be manually displaced in a folded and in an unfolded position, a child supporting bag shaped means fastened between the said upper frame and the said legs, means for supporting the child carrier on a person's back, the said tubular legs being stiffened by a metallic stem operating as a strut, the said upper frame including two terminal portions, resilient detents cooperating with the said terminal portions of the said upper frame so as to removably fasten the upper frame in the unfolded position and when released to provide foldability of the upper frame against the said legs, each flange of the said box being formed with two intersecting grooves of profile complementary respectively to the section of the said upper and lower frame, the portion of the box comprised between the said intersecting grooves being profiled as profiled intersecting planes, whereby during the passage from the said folded to the said unfolded position and viceversa, the said flanges are elastically diverged from one another and thereafter cause a positive elastically contrained location of the said lower frame in said folded respectively unfolded position, the upper frame and the lower frame folding away from the said legs when the carrier is used as a baby chair the upper frame and the lower frame folding against the said legs when the carrier is stored the upper frame folding from the legs and the lower frame folding against the legs when the carrier is used as a baby pack.

4,044,932

SMOKING PIPE SLING

Ellsworth L. Harris, Jr., 4624 G St., SE., Washington, D.C. 20019

Filed Oct. 16, 1975, Ser. No. 623,002
Int. Cl.² A45C *11/00*
U.S. Cl. 224—26 R **3 Claims**

1. A sling for holding a pipe readily accessible on the belt of a pipe smoker comprising: a main body member of a single piece of material having two ends, one end having means for attachment to a belt, a pipe stem holding member of rectangular shape and of substantially the same width as the main body member and closely associated with the one end thereof, means for attaching the stem holding member to the one end of the main body member at the edges thereof, the other end of the main body member being bent back upon itself to form a U-shaped pouch for holding the bowl of a pipe, means for holding the edges together of the portion of the member forming the

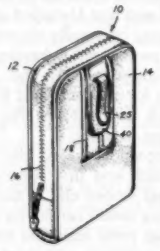
pouch to permit a readily adjustable change in size of the pouch, said means including evenly spaced holes through the edges of the member, a removable cord appropriately interwoven through selected ones of said holes to hold the side edges together before and after adjustment of the pouch, but easily loosened, removed, and rethreaded through other selected ones of said holes to permit said adjustment in the size of the pouch, and knots in the respective ends of the cord to hold the sling together as adjusted and assembled.

4,044,933

ARTICLE CARRIER WITH IMPROVED COMBINATION BELT LOOP AND CLIP

Kenneth W. Artz, Albuquerque, N. Mex., assignor to Kosgegi Leather & Vinyl Products, Inc., South Bend, Ind.

Continuation of Ser. No. 531,486, Dec. 11, 1974, Pat. No. 3,937,373. This application Jan. 9, 1976, Ser. No. 647,996
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.² A45C *11/00*
U.S. Cl. 224—26 R **1 Claim**



1. In an article carrier which includes a back having front and rear faces, the improvement comprising a loop member having upper and lower ends, said loop member having inner and outer sides, means attaching said upper and lower loop member ends to said carrier back with said loop member inner side spacedly confronting said back face to define a belt receiving passage between the back and loop member, clip means connected to said loop member at its outer side and including a downturned flexible part for engaging a belt, pocket or similar object to support said article carrier when no belt extends through said loop member defining passage, said clip means

including an inverted U-shaped holder having a pair of depending leg parts connected by a web part, a cover having a horizontal slot therein, means connecting said cover at its margins to the outer side of said loop member, said cover and loop member forming an envelope, said cover slot communicating with the interior of said envelope, one of said clip means leg parts extending through said slot and into the interior of said envelope, theother clip means leg part extending downwardly over said cover for engaging said belt, pocket or similar object, means associated with said one leg part for securing said one leg part within said envelope interior.

4,044,934

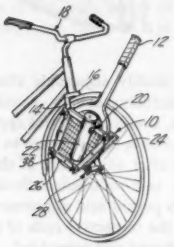
TENNIS RACQUET AND BALL CARRIER FOR BICYCLES

Frederick E. Peters, 14720 Richmond, Southgate, Mich. 48195

Filed Apr. 25, 1975, Ser. No. 571,593

Int. Cl.[2] B62J *11/00*

U.S. Cl. 224—36 **1 Claim**



1. A tennis racquet press adapted to be mounted to the fork of the steering column of a conventional bicycle, said tennis racquet press comprising:

a pair of spaced press members and first connecting means for compressing said pres members toward one another to press against a tennis racquet disposed thereinbetween;

second connecting means carried on the outside surface of one of said press members for releasable attachment of said press to said cycle wheel frame, said second connecting means comprising first and second U-shaped clips each having a base and legs, each clip legs fabricated from a flexible material permitting the clip legs to receive a portion of said cycle wheel frame in a snap-locking relationship, one of said first U-shaped clip legs having a flexible post projecting outwardly therefrom, the outside surface of said one press member having a plurality of apertures, one of which selectively and releasably receives said flexible post for attaching said first clip to said one press member such that said first clip is pivotally mounted to said one press member;

one of said second U-shaped clip legs having an aperture through which said first connecting means extends for attaching said second clip to said one press member; and

third connecting means carried on the outside surface of the other of said press members for releasably attaching a tennis ball container, said third connecting means comprising a horseshoe-shaped member, the extended ends thereof being adapted to receive and snap lockingly engage said tennis ball container, said horseshoe-shaped member having flexible post projecting outwardly therefrom the outside surface of, said other press member having a plurality of apertures, one of which selectively and releasably receives said flexible post for attaching said horseshoe-shape member to said other press member such that said horseshoe-shaped member is disposed in a plane which is perpendicular to said other press member and pivotal about an axis which is perpendicular to said other press member.

4,044,935

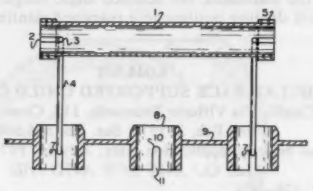
AUTOMOTIVE BATTERY CARRIERS

Hugh Stephens, 90 Leighton Ave., Winnipeg, Manitoba, Canada

Filed Apr. 14, 1976, Ser. No. 670,387

Int. Cl.[2] B65D *71/00*

U.S. Cl. 224—45 F **2 Claims**



1. In an automotive battery lifter of the type having a rigid handle of dielectric material having end slots disposed horizontally and which slidably receives two-point suspension means for linking said handle with said battery, the improvement consisting in said handle having telescopic end pieces to block the sliding movement at said points of suspension, and each said suspension means comprising a length of wire squarely bent and subsequently tempered to an inverted U configuration to form a pair of spring legs unitarily pivotal one at each of said points of suspension, the extremity of each said pair of legs having lower free ends enamelled to prevent acid corrosion, and said pair of spring legs each having a pair of lugs, each lug being bent at right angles from each leg, and each lug of said pair of lugs extending away from each other, said lugs to be less in length than the radius of a battery filling well, said spring legs being compressible to permit said lugs to be inserted into the filling well of said battery and when sprung engage the lower wall of the filling well and remain in locked position to facilitate the carrying of the automotive battery.

4,044,936

GLASS TUBE CUTTING

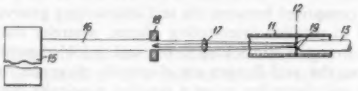
Derek Obersby, Great Hayward, near Stafford, and Thomas Kenneth Allen, Abingdon, both of England, assignors to James A. Jobling & Company Limited, Sunderland, England

Filed May 13, 1975, Ser. No. 577,083

Claims priority, application United Kingdom, May 21, 1974, 22588/74

Int. Cl.[2] B26F *3/14*; C03B *33/06*

U.S. Cl. 225—2 **18 Claims**



1. A method of cutting glass tubing transverse to its length, which method comprises:

forming a point of weakness on a surface of the tube at a required cutting position;

directing radiation at the tube so that sufficient stress is created in the glass to cause a fracture to run around a circumferential line passing through said point of weakness; and generating said radiation by

causing a laser beam of a wave length which is absorbed by the glass to converge from a position outside the tube whereby the beam is focused onto the glass,

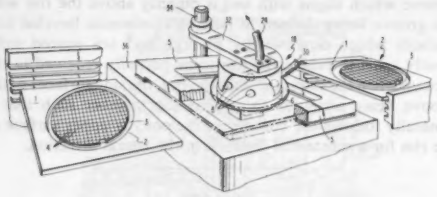
directing the laser beam longitudinally along the tube, and

deflecting the direction of the beam so that the beam is focused fully incident on said circumferential line around the tube passing through the point of weakness without rotating the tube.

4,044,937
MULTIPLE BALL ELEMENT WAFER BREAKING APPARATUS

Thomas Hill, Gainesville; Ambrose Kennedy, Manassas, both of Va., and Walter Grey Thomson, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,632
Int. Cl.[2] B26F *3/00*
U.S. Cl. 225—97 **5 Claims**

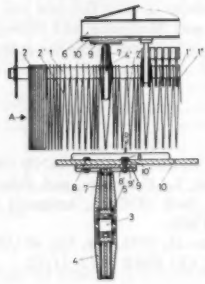


1. An apparatus for breaking a semiconductor wafer along pre-scribed lines, comprising;
- a support means;
- a plurality of ball elements mounted on said support means;
- said ball elements having a diameter substantially smaller than the diameter of said wafer;
- a sliding carriage means associated with said support means;
- a flexible adhesive sheet attached to said carriage means defining a contact plane;
- said wafer being mounted on said flexible sheet so as to be capable of motion in said contact plane over said support means;
- said ball elements contacting said flexible sheet so as to deflect said flexible sheet out of said contact plane thereby inducing a bending moment about points in said wafer juxtaposed with said ball elements;
- said carriage means displacing said flexible sheet in said contact plane so as to break said wafer along pre-scribed lines;
- whereby the semiconductor wafer is broken along the pre-scribed lines in an improved manner.

4,044,938
WIRE COIL GUIDING DEVICE FOR WIRE TREATMENT APPARATUS

Wolfgang Heiss, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed May 5, 1976, Ser. No. 683,041
Claims priority, application Switzerland, May 20, 1975, 6455/75
Int. Cl.[2] B65H *51/02*; B61F *23/00*
U.S. Cl. 226—168 **8 Claims**

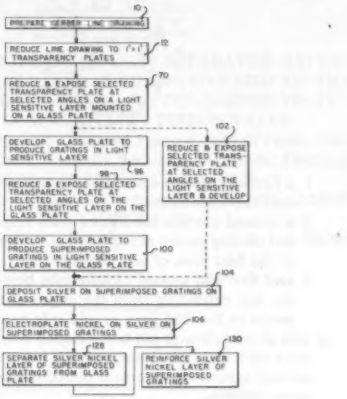


1. A device for guiding coils of wire through wire treatment apparatus, particularly jet descaling machines, comprising a rotating horizontal carrier shaft having said coils of wire suspended therefrom and imparting to said coils rotative movement about said shaft to transport said coils relative to said treatment apparatus in a direction generally parallel to the axis of said shaft, and guide disc means including at least one guide disc positioned on both sides of said carrier shaft, each of said guide discs being freely rotatable about a rotational axis of the disc arranged to extend generally parallel to the direction of transport of the wire coils.

4,044,939
METHOD OF FABRICATING DIFFRACTION GRATING MASTERS AND APPARATUS THEREFOR

William R. Horst, Dayton; James L. McNaughton, Kettering, and Charles F. Mort, Xenia, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sept. 8, 1975, Ser. No. 611,377
Int. Cl.[2] G02B *27/38*; B23P *3/24*
U.S. Cl. 228—176 **11 Claims**


PREPARE (GERBER) LINE DRAWING
REDUCE LINE DRAWING TO (1st) TRANSPARENCY PLATES
REDUCE & EXPOSE SELECTED TRANSPARENCY PLATE AT SELECTED ANGLES ON A LIGHT SENSITIVE LAYER MOUNTED ON A GLASS PLATE
DEVELOP GLASS PLATE TO PRODUCE GRATINGS IN LIGHT SENSITIVE LAYER
REDUCE & EXPOSE SELECTED TRANSPARENCY PLATE AT SELECTED ANGLES ON THE LIGHT SENSITIVE LAYER ON THE GLASS PLATE
REDUCE & EXPOSE SELECTED TRANSPARENCY PLATE AT SELECTED ANGLES ON THE LIGHT SENSITIVE LAYER & DEVELOP
DEVELOP GLASS PLATE TO PRODUCE SUPERIMPOSED GRATINGS IN LIGHT SENSITIVE LAYER ON THE GLASS PLATE
DEPOSIT SILVER ON SUPERIMPOSED GRATINGS ON GLASS PLATE
ELECTROPLATE NICKEL ON SILVER ON SUPERIMPOSED GRATINGS
SEPARATE SILVER NICKEL LAYER OF SUPERIMPOSED GRATINGS FROM GLASS PLATE
REINFORCE SILVER NICKEL LAYER OF SUPERIMPOSED GRATINGS

1. A method of producing a diffraction grating master capable of producing superimposed diffraction gratings, comprising the steps of:
- a. exposing a first grating pattern means on a light sensitive layer;
- b. processing said light sensitive layer from step (a) to physically form a first grating means in said light sensitive layer corresponding to said first grating pattern means;
- c. exposing a second grating pattern means on said light sensitive layer from step (b);
- d. processing said light sensitive layer from step (c) to physically form a second grating means in said light sensitive layer corresponding to said second grating pattern means;
- e. depositing a thin layer of material on said layer from step (d) to physically conform to said first and second grating means on said light sensitive layer; and
- f. reinforcing said thin layer of material from step (e).

4,044,940
WRAPPER BLANK

C. R. Helms, Collegeville, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 26, 1976, Ser. No. 718,053
Int. Cl.[2] B65D *5/02*
U.S. Cl. 229—40 **1 Claim**

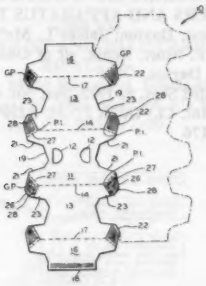
1. A wrapper blank for a group of containers, said blank comprising:
- a. a main panel;
- a pair of side panels foldably connected to side edges of said main panel;
- c. a pair of closing panels foldably connected to said side

panels remote from said main panel and joined to define a tube;

d. the edges of all of said panels being pivoted with cutaway portions to form a scallop-like configuration along both edges of the blank;

e. each of said cutaway portions being generally U-shaped with divergent sides thereof extending toward the fold lines joining said panels and defining at such fold lines wrapper elements folded into position to restrain movement of the containers within said wrapper;

f. each of said wrapper elements comprising:



1. a first closure tab extending from said side panels adjacent the ends thereof;

2. a second closure tab folded with respect to said main and closing panels along fold lines extending at an angle to the fold lines of said panels;

3. said first and second closure tabs being separated by a cut line extending from the edges of the wrapper elements to the fold lines at said side panels;

g. said second closure tab being folded into lapping engagement with said first closure tab and being secured together to bear against the endmost containers to restrain movement thereof.

4,044,941

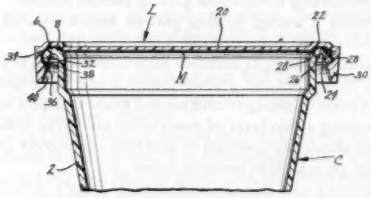
CONTAINER CLOSED BY A MEMBRANE TYPE SEAL

David S. Knudsen, 3145 Hawthorne Blvd., St. Louis, Mo. 63104

Filed Apr. 12, 1976, Ser. No. 675,798

Int. Cl.[2] B65D *5/64, 53/00*

U.S. Cl. 229—43 **15 Claims**



1. The combination comprising: a container having an upwardly presented opening and a rim surrounding the opening and being formed entirely from a nonmetallic material, the rim having a convex upwardly presented surface; a flexible seal membrane extended over the open top of container as well as over the convex upwardly presented surface of the rim, the membrane including a metal foil which is at least located in the area of the membrane overlying the rim of the container so that the membrane may be induction heated to a prescribed temperature by placing it in a magnetic field which undergoes rapid reversals in polarity; a nonmetallic sealing material interposed between the convex surface of the rim and the foil of the membrane, the sealing material being capable of becoming plastic when heated to the prescribed temperature, the sealing material being plastically deformed between and adhered to the foil and the rim at the convex surface as a result of the foil being induction heated to the prescribed temperature and forced toward the rim with plastic deformation being sufficient to effect a seal between the opposed surfaces of the membrane and rim; and a lid including a cross portion which overlies the membrane and the container rim and a downwardly projecting skirt at the periphery of the cross portion with the skirt fitting snugly around the rim, the cross portion having a preformed groove which aligns with and is directly above the rim with the groove being defined in part by continuous beveled side surfaces which downwardly diverge and are spaced sufficiently apart to enable the rim to be partially received in the groove when the skirt is around the rim, the side surfaces of the groove being arranged to confine the member such that it generally follows the contour of the convex upper surface of the rim for a substantial distance in the lateral direction.

4,044,942

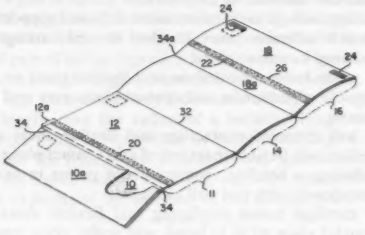
MULTIPLE MAILING FOLDER

Jack Edward Sherwood, Roanoke, Va., assignor to Double Envelope Corporation, Roanoke, Va.

Filed Sept. 17, 1974, Ser. No. 506,709

Int. Cl.[2] B65D *27/06*

U.S. Cl. 229—73 **8 Claims**



1. A multiple use mailing folder, formed from a blank consisting of an elongated strip of sheet material having transverse fold lines dividing said strip into five panels, the first panel at one end of said strip having been folded forwardly against the adjacent second panel and adhesively secured thereto at its ends to form an envelope pocket, the said envelope pocket having been folded rearwardly on the fold line between the second and third panels, said third panel being of greater width than said first and second panels having a portion of said third panel exposed beyond the said envelope pocket, said fourth panel having been folded forwardly along the fold line between said third and fourth panels to overlie said third panel on its side remote from said envelope pocket. Said fifth panel having been folded forwardly along the fold line between said fourth and fifth panels to overlie the fold line between said envelope pocket and said third panel and to overlie said envelope pocket and being of a width to overlie at least part of said portion of said third panel exposed beyond said envelope pocket.

4,044,943

CENTRIFUGAL SEPARATOR AND SYSTEM

Francis Barton Brown, La Crescenta, and John W. Erickson, Huntington Beach, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed June 21, 1976, Ser. No. 697,987

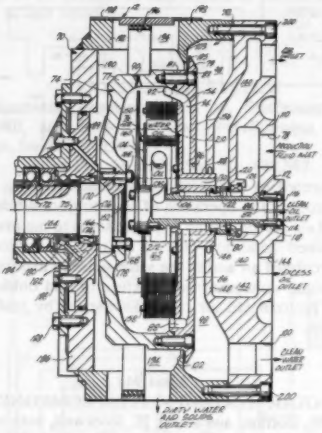
Int. Cl.[2] B04B *1/12, 11/02*

U.S. Cl. 233—19 A **25 Claims**

1. In a centrifugal separator for separating the phase constituents of a multiconstituent feed of solid, liquid and gaseous phases, an improvement which comprises:

a. a housing;

b. a rotor rotatable in the housing and having a rotor chamber;
c. passage means for delivering the multiconstituent feed to the rotor chamber;
d. means to define radial zones of mixture phase constituents stratified in accordance with their density and in response to centrifugal force applied through the rotor, such means including exit passages from the rotor chamber for the individual phase constituents of the feed, the exit passages



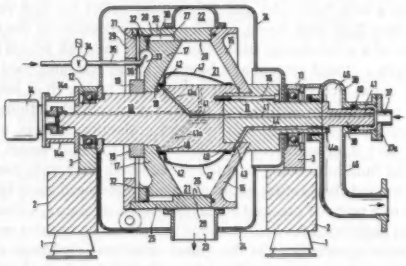
including a pitot tube having a mouth in the chamber at a selected radial zone therein for a select one of the phases, a plurality of constructed passages opening at the radial perimeter of the chamber for the solid phase, and a control fluid passage opening into the chamber between the constricted passages and the pitot tube for a control phase liquid of the phases, whereby the quantity of control phase liquid in the chamber determines the radial position of the other non-solid phases in the rotor chamber.

4,044,944

CENTRIFUGE

Bernhard Moebus, Waiblingen, Germany; Gerhard Larch, St. Marienkirchen, Austria, and Rudolf Friedrich, Pocking, Germany, assignors to Fa. Moebus KG., Stuttgart, Germany

Filed Mar. 17, 1976, Ser. No. 667,548
Claims priority, application Germany, Apr. 24, 1975, 2518206
Int. Cl.[2] B04B *1/14, 11/04*
U.S. Cl. 233—20 A **12 Claims**



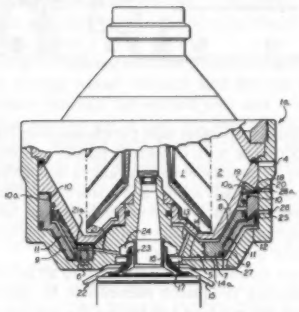
1. A centrifuge for separating and/or thickening liquid/solid mixtures, comprising in combination,
a support frame;
horizontal shaft means rotatably mounted in said support frame and having at least one first liquid/solid mixture supply conduit and at least one second clarified liquid outlet conduit disposed therein;
a drive motor operatively connected to said shaft means for rotating it;
two conical drum members axially rigidly mounted on said shaft means in spaced relationship to each other;
the respective outlet of said first conduit and the inlet of said second conduit being disposed on said shaft means between said two conical drum members;
a hollow cylindrical member axially slidably mounted on one of said two conical drum members and movable between a fully open and a closed position on one of said two conical drum members;
said shaft means and two conical drum members define a centrifuging chamber therebetween which can be opened or closed by the axial movement of said hollow cylindrical member;
said horizontal shaft means has a diameter which is at least a third of the maximum diameter of said centrifuging chamber.

4,044,945

SELF-CLEANING CENTRIFUGAL SEPARATOR HAVING A MAIN PISTON VALVE DEFINING ONE SIDE OF THE SEPARATING CHAMBER AND CONNECTED TO AT LEAST ONE AUXILIARY PISTON VALVE

Werner Kohlstette, and Gunthard Pautsch, both of Oelde, Germany, assignors to Westfalia Separator AG, Oelde, Germany

Filed May 14, 1976, Ser. No. 686,614
Claims priority, application Germany, May 16, 1975, 2521838
Int. Cl.[2] B04B *11/04*
U.S. Cl. 233—20 A **4 Claims**



1. In a centrifugal separator constructed for intermittent discharge of sludge, comprising:
a rotatably mounted separator drum having an upper end member and a lower end member, and at least one sludge discharge passageway disposed at the radially outward periphery of the drum, one of said end members comprising a main piston valve movable axially to open and close the sludge discharge passageway for desludging, a closing chamber disposed in the drum outwardly of the main piston valve for receiving and discharging control fluid for, respectively, forcing the main piston valve to the closed position and relieving force for initiating the moving of the main piston valve to its open position under the influence of material filling the drum, means for supplying fluid to the closing chamber and means for discharging fluid therefrom,
the improvement which comprises:
an auxiliary piston valve mounted in the drum and on the main piston valve and disposed axially outwardly of the main piston valve, a partition ring mounted in the drum and separating a portion of the auxiliary piston valve from the main piston valve, the auxiliary piston valve

being axially moveable in the drum so that an auxiliary piston valve closing chamber is provided on the axially outward side of the auxiliary piston valve and an auxiliary piston valve opening chamber is provided on the axially inward side of the auxiliary piston valve, and means for supplying control fluids to the auxiliary piston valve closing and opening chamber for, respectively, exerting a closing and opening force on the auxiliary piston valve, the mounting of the auxiliary piston valve on the main piston valve being such that said closing and opening forces on the auxiliary piston valve are transmitted to the main piston valve and add to the influence of the control fluid of the closing chamber of the main piston valve.

4,044,946

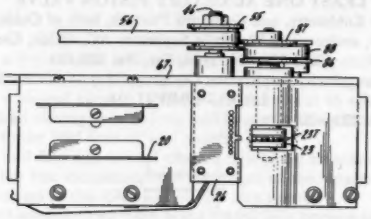
TAPE PUNCH MACHINE

Gerhard Cless, and Edward L. Kaplan, both of Northbrook, Ill., assignors to Extel Corporation, Northbrook, Ill.

Continuation-in-part of Ser. No. 638,998, Dec. 8, 1975, abandoned, which is a division of Ser. No. 485,096, July 5, 1974, Pat. No. 3,964,673. This application Sept. 27, 1976, Ser. No. 726,768

Int. Cl.[2] G06K *1/02*

U.S. Cl. 234—39 **3 Claims**



1. A cyclically operable tape punch machine for punching a tape in accordance with command signals and comprising:

a plurality of punch elements arranged in openings formed in a die block for advancing and restoring movement, including a special punch element for punching the tape with a feed opening, the punch elements having shanks of substantially the same diameter;

interposers movable from a restored to an actuated position for selecting the punch elements to be operable in each cycle of the machine and having the selector ends thereof disposed adjacent the punch elements in their restored position;

and said special punch element having a punching stem of reduced diameter off-set to one side of its stem for punching a feed hole which is off-center compared to the openings punched by the other punch elements.

4,044,947

CONDITION AND VOLUME CONTROL FOR AIR CONDITIONING SYSTEM MIXING DAMPERS

Donald H. Spethmann, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 1, 1976, Ser. No. 691,668

Int. Cl.[2] F24F *13/04*

U.S. Cl. 236—13 **20 Claims**

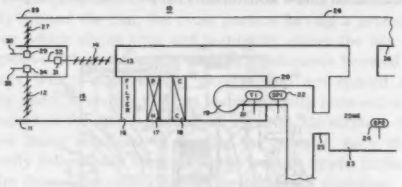
1. In an air conditioning system for supplying a volume of conditioned air to at least one zone, said system having a source of outdoor air and an outdoor air damper and a source of recirculated air and a recirculated air damper and discharge means for discharging a mixture of recirculated air and outdoor air to said at least one zone, a control apparatus adapted to control the condition and volume of air discharged by said discharge means comprising:

first actuating means adapted to operate said outdoor air damper;

second actuating means adapted to operate said recirculated air damper;

sensing means for sensing said condition and volume of said mixture of recirculated air and outdoor air; and,

control system means responsive to said sensing means and



connected to said first and second actuating means for controlling the operation of said outdoor air and recirculated air dampers in an opposite sense to maintain a predetermined condition of said mixture of outdoor air and recirculated air and in the same sense to maintain a predetermined volume of said mixture of said outdoor air and said recirculated air to be discharged by said discharge means.

4,044,948

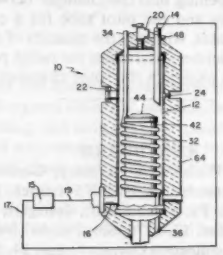
SOLAR HEATING SYSTEM COMPONENT

Edward W. Bottum, and Frank H. Rockwell, both of Brighton, Mich., assignors to Refrigeration Research, Inc., Brighton, Mass.

Filed Oct. 17, 1975, Ser. No. 623,251

Int. Cl.[2] F24J *3/02*

U.S. Cl. 237—1 A **5 Claims**



1. A solar heating system component comprising a closed vessel, a first fluid inlet and a first fluid outlet for said vessel, said first fluid inlet being adapted for connection to the fluid outlet of a solar energy collection system through which fluid flows in a closed system as a heat exchange medium, said first fluid outlet being adapted for connection to the fluid inlet of said solar energy collection system, said vessel defining an expansion tank for said solar energy collection system, a second fluid inlet and a second fluid outlet for said vessel, said second fluid inlet being adapted to receive a fluid to be heated, said second fluid outlet being adapted to forward such heated fluid to a point of use, and a heat exchange structure within the vessel positioned for heat exchange relationship to solar energy collector system fluid in the vessel, said heat exchange structure including means for fluid flow therethrough, said second fluid inlet and outlet being operably connected to said heat exchange structure, a first fluid pump connected to said first fluid outlet and a second fluid pump connected to said second fluid inlet for circulation of fluid through the respective systems, a first temperature sensor located to sense the temperature at the collector outlet, a second temperature sensor lo-

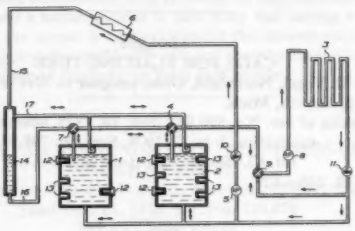
cated to sense the temperature of fluid pumped by said second pump, a differential thermostat connected to said first and second sensors, means operably connecting said differential thermostat to said pumps to de-energize said pumps when the temperature of fluid being pumped by said second pump approaches the temperature of the fluid being pumped by said first pump, a pressure release valve for said vessel, and an air valve operable to close and open on said vessel located at a position above a selected level of solar energy collection system fluid to be present in said vessel to permit relief of air pressure in said vessel.

4,044,949

HEAT STORAGE SYSTEM

Ernst Morawetz, Repslagarevagen 10, Staffanstorp, Sweden (S-24500), and Lars-Olof Glas, Fabriksvagen 1, Vasterhaninge, Sweden (S-13700)

Filed Feb. 26, 1976, Ser. No. 658,557
Int. Cl.[2] F24J *3/02;* **F24D** *3/00*
U.S. Cl. 237—1 A **8 Claims**



1. An automatic heat storage system containing circulating fluid heating medium comprising:

a. means for collecting solar heat energy having a heating medium inlet and outlet,

b. a first heat storage vessel having openings for heating medium inlet or outlet at the top and bottom thereof, the top opening being connected to a first valve means,

c. a second heat storage vessel, operably associated with auxiliary heating means for heating medium therein, having openings for heating medium inlet or outlet at the top and bottom thereof, the top opening being connected to a second valve means,

d. a heat emitting system having a heating medium inlet and outlet,

e. a first pump for circulating heating medium through said solar heat energy collecting means,

f. a second pump for circulating heating medium through said heat emitting system,

g. a first pipe connecting the outlet of the solar heat energy collecting means with said first valve means,

h. a second pipe connecting said first valve means with said second valve means,

i. a third pipe connecting said second valve means with the inlet of said heat emitting system through said second pump,

j. a fourth pipe connecting at one end thereof to the outlet of said heat emitting system and at the other end thereof to said first pump,

k. a fifth pipe connecting said first pump with the inlet of said solar heat energy collecting means,

l. a sixth pipe connecting with said fourth pipe and the bottom openings of both said first heat storage vessel and said second heat storage vessel,

m. said pumps, said pipes and first and second valve means being the means adapted to control the flow of the heating medium in the following alternate paths:

i. passing the heating medium from said solar heat collecting means through the first pipe and partially through the first valve means, the second valve means, the third pipe and second pump, and the heat emitting system and returning heating medium through the fourth pipe, said first pump and the fifth pipe to said solar heat energy collecting means; and partially through the first and second valve means into the top of both said first and second heat storage vessels, while withdrawing heating medium from the bottom of said first and second heat storage vessels through the sixth and fourth pipes, said first pump and the fifth pipe to said solar heat energy collecting means,

ii. passing the heating medium from said solar heat energy collecting means through the first pipe, and partially through the first valve means, the second pipe, the second valve means, and the third pipe and second pump, through the heat emitting system and returning heating medium through the fourth pipe, said first pump and the fifth pipe to said solar heat energy collecting means; and partially into the top of said first heat storage vessel through said first valve means; while withdrawing heating medium from the bottom of said first heat storage vessel through the sixth pipe and passing it through the fourth pipe, said first pump and the sixth pipe to said solar heat energy collecting means,

iii. passing heating medium from the top of said first heat storage vessel through said first valve means, the second pipe, the second valve means, and the third pipe and second pump, through said heat emitting system and returning heating medium through the fourth pipe and sixth pipe to the bottom of said first heat storage vessel,

iv. passing heating medium from the top of said second heat storage vessel through said second valve means, and the third pipe and second pump, through said heat emitting system and returning heat medium through the fourth and sixth pipe to the bottom of said second heat storage vessel,

v. passing the heating medium from the top of said second heat storage vessel through said second valve means partially through the second pipe and said first valve means into the top of said first heat storage vessel, and partially through said third pipe and second pump, through said heat emitting system, and returning heating medium from the bottom of said first heat storage vessel into the bottom of said second heat storage vessel through the sixth pipe, and from said heating emitting system through the fourth and sixth pipes into the bottom of said second heat storage vessel,

vi. passing the heating medium from said solar heat energy collecting means through the first pipe, said first valve means, the second pipe, said second valve means, and the third pipe and second pump, through said heat emitting means and returning it to said solar heat energy collecting means through the fourth pipe, said first pump and said fifth pipe.

4,044,950

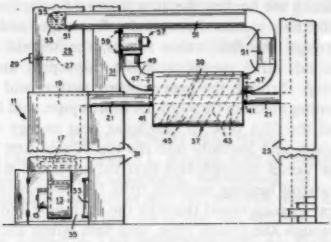
COMBINED HEAT-EXCHANGER AND SUPPLEMENTAL AIR CIRCULATOR FOR HOT-AIR FURNACES

Charles F. Engeling, R.R. No. 1, Morrisonville, Ill. 62546, and Ralph F. Staubly, 510 Myers Bldg., Springfield, Ill. 62701

Filed Sept. 8, 1975, Ser. No. 611,357
Int. Cl.[2] F24B *7/02*
U.S. Cl. 237—55 **4 Claims**

1. In a forced-circulation air-heating system comprising a conventional fuel-burning hot-air furnace including a hot-air-feed duct system and a cold-air-return duct system, a pipe for conducting flue gases away from said furnace, a first thermostatic switch in and responsive to the temperature of the space to be heated, furnace-connected fuel-supply means controlled by said first thermostatic switch, a relatively high-power motorized blower for forcing air from said return system through said furnace and to said feed system, an air filter in the air-flow

path to and through and from said furnace, a second thermostatic switch located in the hot-air portion of said air-flow path for energizing said high-power motorized blower upon a selected rise in furnace air temperature, the improvement comprising: a normally constantly energized relatively low-power motorized blower, and duct means connecting said latter blower so as to force air from said return system into said feed system in bypassing relation to said furnace and its air filter,



said duct means including in series therewith a heat-exchanger adapted for good thermal association with said flue-gas pipe, and said heat-exchanger including means for performing an indirect heat exchange between the cold by-pass air and the hot flue gases or combustion products, whereby, the lower-power blower being normally constantly energized during heating periods, a gentle temperature-stratification-reducing air-flow is produced.

4,044,951

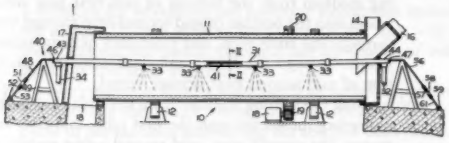
SPRAY TUBING WITHIN A ROTATING DRUM SUPPORTED INDEPENDENTLY OF THE DRUM

John J. Waite, Chateauguay, Canada, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 523,526, Nov. 13, 1974, Pat. No. 3,933,313. This application Sept. 18, 1975, Ser. No. 614,521

Int. Cl.[2] F16L *3/00;* **F26B** *11/04*

U.S. Cl. 239—1 **2 Claims**



1. In a method of supporting an elongated spray pipe within the cylindrical shell of a rotating cooling device comprising;

of providing the spray pipe with a support internally thereof and extending outwardly from each end of the spray pipe and the cylindrical shell;

of anchoring both external ends of the support externally of the cylindrical shell; and,

of applying a tensioning force to at least one external end of the support.

4,044,952

FOLDING BOOM

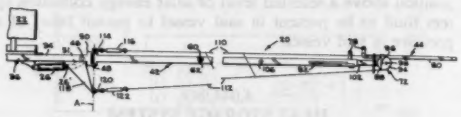
Michael R. Williams, and Dean T. McDonald, both of Jonesboro, Ark., assignors to FMC Corporation, San Jose, Calif.

Filed June 28, 1976, Ser. No. 700,664

Int. Cl.[2] B05B *1/20*

U.S. Cl. 239—165 **14 Claims**

1. A two-piece foldable boom comprising frame means, an inner boom arm supported by said frame means for pivotal movement about a generally vertical axis, an outer boom wing, mounting means connecting said wing to said inner boom arm for axial sliding movement and pivotal movement about a generally upright axis, resilient means urging said wing outwardly, first flexible torque applying and spring resisting means connected at one end thereof to said wing to urge said wing to pivot about said upright axis in one direction, second flexible torque applying and spring resisting means connected at one end thereof to said wing to urge said wing to pivot about said upright axis in the opposite direction whereby when said wing is caused to pivot about said upright axis one of said



flexible means resists the entire force of said resilient means causing inward sliding movement of said wing and slackening of said other flexible means, said resilient means exerting a rotative torque on said wing which tends to return said wing to a position wherein said resilient means is equally resisted by both of said flexible means and said wing is aligned in a generally parallel end-to-end relationship with said arm.

4,044,953

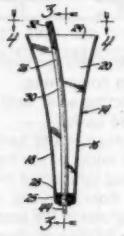
CAGE FOR FLAILING TUBE

John D. Vogel, Northfield, Ohio, assignor to McCord Corporation, Detroit, Mich.

Division of Ser. No. 550,542, Feb. 18, 1975, abandoned. This application July 27, 1976, Ser. No. 708,931

Int. Cl.[2] B05B *1/10, 3/14;* **B08B** *3/02*

U.S. Cl. 239—229 **3 Claims**



1. An assembly for directing fluid toward a surface comprising; cage means having an open entrance at one end thereof, a flexible tube having a first end anchored within said cage member at a point spaced from said entrance, said tube including a freely movable portion extending toward said entrance and terminating at a second end adjacent said open entrance, said cage means including a pair of oppositely disposed curved walls, said curved walls being curved away from one another upwardly and outwardly toward said open entrance and away from the longitudinal direction of the flexible tube for engaging said tube to curve said tube between the ends thereof.

4,044,954

NOZZLE

Duncan Paul Campbell, R.R. No. 1, Georgetown, Ontario, Canada

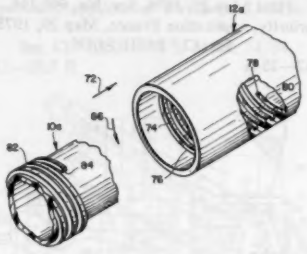
Filed Feb. 9, 1976, Ser. No. 656,403

Int. Cl.[2] B05B *1/32*

U.S. Cl. 239—458 **4 Claims**

1. A nozzle comprising a hollow body; a sleeve disposed about said body and having a baffle seat, one of said sleeve and said body having a female thread formed in its inner and outer wall respectively for mating with a male thread formed on the respective inner and outer wall of the other of said sleeve and body to permit rotation of said sleeve relative to said body between upstream and downstream stop positions, said female thread having spaced helically extending side walls which

terminate at an end wall at the trailing edge of the thread, said end wall being disposed generally normal to said side walls adjacent thereto and abutting against the leading edge of said male thread when said sleeve is at the upstream stop position and preventing further upstream rotation of said sleeve, said



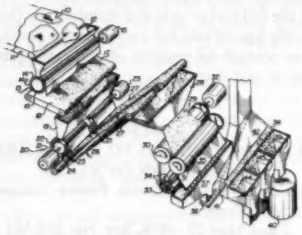
male and female threads throughout their extents between the upstream and downstream stop positions having uniform cross sections; and a baffle secured to said body and having a head which, as the sleeve is rotated toward the downstream stop position, approaches said baffle seat and thereby diminishes the quantity of liquid discharging from said nozzle.

4,044,955

RECOVERY OF ALUMINUM FROM ALUMINUM-GLASS CLOTH RESIDUES

John P. Skelton, 101-515 Francois, Montreal, Quebec, Canada

Filed Oct. 12, 1976, Ser. No. 731,676
Int. Cl.[2] B02C *19/12*
U.S. Cl. 241—14 **6 Claims**



1. A method of reclaiming aluminum from aluminum-glass cloth residues in which the glass cloth is coated with aluminum comprising the steps of: breaking down said residue into small pieces, squeezing each piece of residue between hard surfaces on a pair of rotating cylindrical rolls with sufficient squeezing pressure to extrude the aluminum coating to destroy its integrity and expose the interior glass fibers along substantially the entire length of each piece and segregating the resulting glass fibers from the remaining aluminum pieces.

4,044,956

MECHANICAL METHOD FOR SEPARATING FRACTIONS OF INCINERATED URBAN REFUSE OR SIMILAR INDUSTRIAL REFUSE

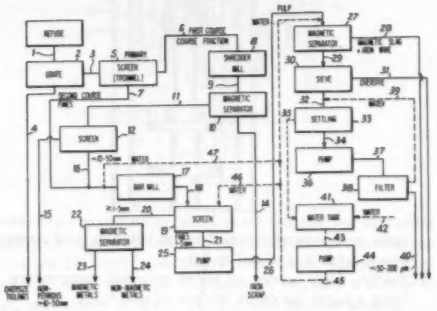
Alexandre Benedetto, Marseille; Roger O. Cuvillier, Jargeau, Orleans, and Jean-Noël Gony, Orleans, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Mar. 12, 1976, Ser. No. 666,374
Claims priority, application France, Mar. 12, 1975, 75.07681
Int. Cl.[2] B02C *23/14*
U.S. Cl. 241—24 **10 Claims**

1. In a method for separating components of thermally degraded urban refuse and/or of industrial wastes of similar nature including the steps of primary screening of said refuse, and finally subjecting the primary screening fractions to a wet-process magnetic separation, the improvement comprising the steps of:

a. immediately and totally subjecting the coarse fraction of said primary screening along a first course to a percussion crushing and shredding operation followed by a magnetic separation operation and a secondary screening, and

b. directing the finer fraction of said primary screening along a second course and joining said first and second courses to form a combined course and subjecting said combined course to a crushing and flattening operation and further subjecting said common course to a third screening and subjecting the oversize fraction of the third screening to further magnetic separation, whereby there are separately extracted:



1. at the end of the first course, the major part of the magnetic metals cleared of all cinders and also non-magnetic metals with sizes exceeding the first course fines and rejected as oversize from the secondary screening of said first course, upstream of its junction with said finer fraction,

2. from the oversize fraction of the third screening made on the products obtained from said crushing and flattening operation in said combined course, and as the outcome of said further magnetic separation, both magnetic and non-magnetic metal fractions having a size comprised between the first course fines and the combined course fines, and from the third screening of said combined course, a combined course fines directed to a wet phase separation for the recovery of metals usable for the preparation of earthenware products.

4,044,957

APPARATUS FOR DISPERSING FINELY DIVIDED SOLID PARTICLES IN A LIQUID VEHICLE

George R. Schold, 7909 2nd St. North, St. Petersburg, Fla. 32507

Filed Feb. 13, 1976, Ser. No. 657,723
Int. Cl.[2] B02C *17/16*
U.S. Cl. 241—46.11 **8 Claims**

1. In apparatus for deagglomerating and dispersing solid particles held in agglomerated form and carried in a liquid vehicle while in a mixing vessel in which the particles are subjected to the action of a dispersing media while being forced to flow through the interior of the vessel and subjected to a contrifugal and agitating action therein which causes the dispersing media to be thrown outwardly and separated from the flow path of the product of liquid mixture being processed;

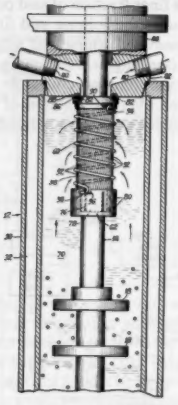
a rotatable shaft extending into said vessel and adapted to be driven from a power source;

a dispersing media separator located interiorly of the mixing vessel so as to be positioned in said flow path and having means for the admission of the processed product there-

into and therethrough so that the product is forced to travel through said dispersing media separator in a direction opposite to that generated by the normal centrifugal force;

said separator comprising a body surrounding and attached to said shaft and rotatable therewith;

means defining inlet and outlet means to and from said separator, said separator outlet means being in fluid communication with said vessel outlet;



a flexible filter screen of sheet material surrounding and lying against the outer surface of said body;

coil spring means surrounding and lying against said filter screen to secure said filter screen to said body; and

means for detachably securing said coil spring means in place around said body.

4,044,958

EDGE MILL

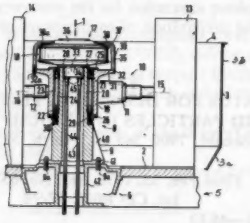
Erwin Gutjahr, Ersingen, Germany, assignor to Karl Handle & Sohne Maschinenfabrik und Eisengiesserei, Muhlacker, Germany

Filed Aug. 7, 1975, Ser. No. 602,654

Claims priority, application Germany, Aug. 9, 1974, 2438346

Int. Cl.[2] B02C *15/00*

U.S. Cl. 241—126 **21 Claims**



1. An edge mill for crushing materials for the manufacture of ceramic and similar articles, which includes: a substantially horizontally extending grinding track, a stationary track column extending at least approximately at a right angle and in upward direction through said grinding track, a cross head arranged above and in vertically spaced relationship to said track and being rotatably mounted on said track column, driver crank means mounted on said cross head, grinding roller means rotatably arranged on said crank means, and driving means comprising a driving motor mounted on said column and also comprising a driven member drivingly connected to said cross head.

4,044,959

PROCESS AND APPARATUS TO WIND CONTINUOUSLY THREAD ON A SUCCESSION OF REELS

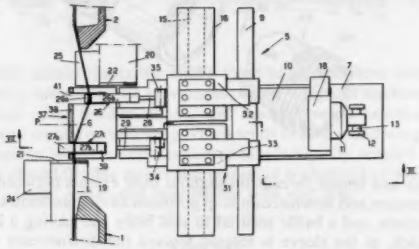
Roland Lemaire, Fere-en-Tardenois, France, assignor to Etudes et Fabrications, France

Filed May 27, 1976, Ser. No. 690,394

Claims priority, application France, May 29, 1975, 75.16848

Int. Cl.[2] B65H *54/00*

U.S. Cl. 242—25 A **9 Claims**



1. An apparatus to wind a thread on a succession of reels, comprising two annuli with parallel and practically horizontal axes, each carrying a coaxial reel, a reel traversing mechanism provided with a pulley movable over the reels for feeding of the thread around the reels in regular layers, means for cutting the thread when one reel has been filled up, means to then ensure without stopping the winding of the thread around a second empty reel, comprising a first movable catch pin being positioned near the empty reel to ensure the gripping of the thread, to allow the cutting of the thread and the coupling of this thread around said empty reel, a second movable catch pin placed near the full reel to grip and maintain the thread perpendicularly to the axis of said full reel after the cutting of thread, and means to control the position of said catch pins at the end of the filling of said first reel.

4,044,960

PROCESS AND APPARATUS TO WIND THREAD ON A SUCCESSION OF REELS

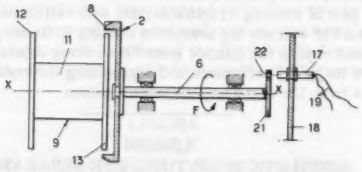
Roland Lemaire, Fere-en-Tardenois, France, assignor to Etudes et Fabrications, France

Filed May 27, 1976, Ser. No. 690,395

Claims priority, application France, May 29, 1975, 75.16849

Int. Cl.[2] B65H *54/00*

U.S. Cl. 242—25 A **9 Claims**



1. A method to wind a thread on a succession of reels supported by coaxial annuli rotatively driven and fitted with a peripheral clamp member to couple the thread on the associated reels fixed on annuli, fixed anvils being provided to cut the thread when a reel has been filled to capacity, the switching-over of the thread from a filled reel to an empty reel being initiated after the detection of a predetermined angular position of the clamp member fixed on the annulus associated with the empty reel, this angular position being measured with respect to the associated anvil.

4,044,961

MULTIPLE-UNIT SPOOLING MACHINE WITH YARN TRAVERSE MECHANISM

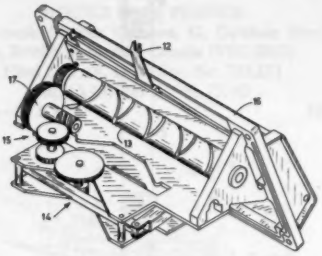
Rudolf Luz, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Mar. 4, 1976, Ser. No. 663,675

Claims priority, application Switzerland, Mar. 26, 1975, 3912/75

Int. Cl.[2] B65H *54/20, 54/28, 54/38*

U.S. Cl. 242—35.5 R 9 Claims



1. Multiple-head spooling machine having a plurality of spooling units (1*a*, 1*b*, 1*c* . . .) located adjacent each other comprising

a common drive shaft (2) for the spooling units of the spooling machine;

a plurality of main gears (18) on the common drive shaft (2), one each located to provide drive power for a respective spooling unit;

each spooling unit including

a wind-up spool carrier (5) for locating a wind-up spool (6) thereon,

means (7) to impart rotation to the wind-up spool (6),

and a yarn traverse mechanism including gearing means therefore located in position to guide yarn in axially traversing movement across the spool (6);

a main gear on each unit located in rotation power transmission postion with the main gear (18) of the respective spooling unit and in engagement with said traverse gearing means to transfer rotational power from the main drive shaft (2) through the respective main gear (18) of the respective spooling unit to the traverse mechanism thereof;

and a plurality of soft engagement clutches (19), one each associated with a respective spooling unit to selectively control rotational power transmission from the common drive shaft (2) to the main gear of each of the respective spooling units and hence to the respective yarn traverse mechanisms,

and wherein at least a portion of the traverse mechanism of each of the spooling units forms a single replaceable assembly.

4,044,962

APPARATUS FOR YARN STORING AND FEEDING TO YARN USING MACHINES

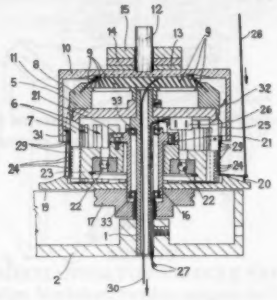
Sergio Calamani, via Settima, 27-Segrate San Felice; Eugenio Turri, via Benedetto Marcello 1-, and Ermanno Savio, via Garofalo 22-, all of Milan, Italy

Filed Apr. 7, 1975, Ser. No. 565,607

Int. Cl.[2] B65H *51/24*

U.S. Cl. 242—47.05 1 Claim

1. An apparatus for storing and feeding yarn to a yarn utilization machine, comprising: a drum which, at least partly, is substantially cylindrical, said drum having a plurality of longitudinal slits distributed throughout its periphery; an arm fitted with members for hooking yarn from a spool and dispensing or distributing it as windings on said drum adjacent one end thereof; drive means for imparting relative rotational motion between said arm and said drum; and a swinging device for translating the windings from said one end of the drum where they are laid by said arm to the other end of said drum, where the yarn is drawn off and supplied to the yarn utilization machine; said swinging device including a shaft extending in said drum and secured therewith, a first bearing on said shaft, a bush mounted on said first bearing and coupled to said drive means for undergoing rotation relative to said shaft, said arm being fixed to said bush, a second roller bearing having an axis inclined to and eccentric with respect to the drum axis; an



annular body mounted on said second bearing and including a plurality of superimposed and spaced blades projecting radially outwardly from its periphery, said blades being distributed in groups positioned and swingable in respective slits in the drum, and means tiltably carrying said second bearing from said bush and including leveling screws between said bush and said second bearing for adjusting the inclination of said second bearing, said annular body and said blades with respect to said drum.

4,044,963

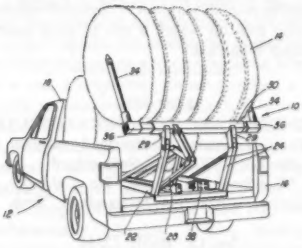
ROUND BALE LOADER, UNLOADER AND UNROLLER

Dewey L. Hostetler, Harper, Kans., assignor to DewEze Mfg., Inc., Harper, Kans.

Filed Sept. 22, 1976, Ser. No. 725,566

Int. Cl.[2] B65H *75/00, 75/40, 17/46*

U.S. Cl. 242—54 R 10 Claims



1. A round bale loader, unloader and unroller for mounting on the rear of a flat bed vehicle, the loader comprising:

a frame attached to the flat bed of the vehicle;

a lateral cross bar pivotly attached to said frame, said cross bar parallel to the rear of the vehicle and adjacent thereto;

expansion means attached to said cross bar for expanding and contracting the length of said cross bar;

hugger arms attached to the ends of said cross bar and extending outwardly therefrom, said hugger arms disposed adjacent the sides of a round bale and gripping the sides thereof when said cross bar is contracted; and

pivot means attached to said cross bar and said frame for

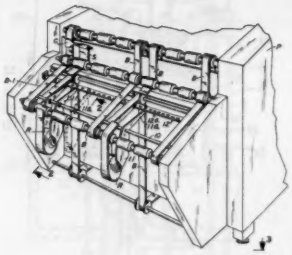
pivoting said cross bar on said frame for loading and unloading a round bale.

4,044,964

ROLL HOLDER FOR PHOTOGRAPHIC PROCESSORS

William B. Kellett, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sept. 7, 1976, Ser. No. 720,979
Int. Cl.² B65H *19/08*
U.S. Cl. 242—58 **8 Claims**



1. A roll holder for mounting supply rolls of photographic strip material to be processed, said holder comprising:

a transversely extending fixed mounting rod,

a fixed adjustment element spaced rearwardly from said mounting rod,

a pair of laterally extending roll mounting pin elements for journaling a supply roll of photographic strip material to be processed,

a pair of spaced apart roll holding brackets, each bracket including:

a hub element rotatably and slidably mounted on said transverse mounting rod,

a roll mounting arm fixed to said hub element and extending forwardly therefrom,

an anchoring arm fixed to said hub element and extending rearwardly therefrom and having an interlocking element adjustably connected to said adjustment element to anchor the bracket in the desired spaced apart from the other bracket of said pair,

said roll mounting arm including a pin receiving slot oriented to rotatably mount in captured relationship the mounting pins on which a roll of strip material to be processed is carried.

4,044,965

MAGNETIC TAPE REEL FOR COMPUTER

Patrick P. Posso, Lausanne, Switzerland, assignor to Societe Anonyme dite: GEFITEC S.A., Switzerland

Filed Sept. 3, 1976, Ser. No. 720,367
Claims priority, application Switzerland, Sept. 19, 1975, 12217/75
Int. Cl.² B65H *75/18*
U.S. Cl. 242—71.8 **3 Claims**

1. A magnetic tape reel for computers, said reel comprising:

a central part comprising:

a driving hub having an annular collar extending radially outwardly from the outer surface of said hub;

a driving ring concentric with said hub and having an annular collar extending radially inwardly from said inner surface of said ring; and

means for interconnecting said hub and said ring;

a first side flange formed with inner and outer substantially cylindrical welding surfaces projecting inwardly from the inner surface thereof and being connected to each said hub and said ring by means of respective first and second ultrasonic welds wherein said inner and outer cylindrical welding surfaces contact one side of said hub collar and said ring collar respectively; and

a second side flange formed with inner and outer substantially cylindrical welding surfaces projecting inwardly from the inner surface thereof and being connected to each said hub and said ring by means of respective third and fourth annular ultrasonic welds wherein said inner

and outer surfaces contact the other side of said hub collar and said ring collar respectively;

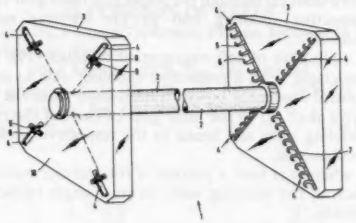
said rigid joining of said first and second side flanges with said hub and said ring by means of said annular ultrasonic welds forming a box-like structure having a high resistance to compression produced by tape being wound thereon.

4,044,966

TAKE-UP FRAME FOR PILE FABRIC

Axel Schneider, Krefeld, Germany, assignor to Scheibler Peltzer & Co., Krefeld, Germany

Filed Jan. 31, 1975, Ser. No. 546,132
Claims priority, application Germany, Feb. 22, 1974, 2408590
Int. Cl.² B65D *85/671*; B65H *75/02*
U.S. Cl. 242—77.1 **2 Claims**



1. A take-up frame for pile fabric comprising in combination:

two one-piece suspension frames, each having a plurality of radially projecting, narrow, elongated slots formed therein, and each frame having a central hub with a cylindrical bore provided therein;

a cylindrical shaft extending between said frames and having its ends seated in said cylindrical bores, said cylindrical shaft being made of an easily penetrable material such as cardboard and the like;

said central hub having openings through its side in line with each of said slots;

a plurality of hook bands, each having a plurality of hooks projecting from one longitudinal edge thereof, each of said hook bands being slidably disposed within one of the slots in one of said suspension frames, with said hooks projecting from the side of the frame facing toward the other frame;

each of said hook bands having a pointed end that projects through the opening in line with its slot and is adapted to penetrate said cylindrical shaft; and

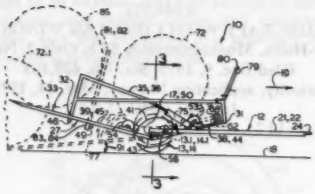
said hook bands being urged longitudinally within said slot in the direction toward the hub by tension of pile fabric attached to said hooks so as to cause said pointed ends to penetrate the cylindrical shaft and thereby lock said suspension frames to the shaft.

4,044,967

ROUND BALE FEEDER

Lawrence Joseph Charles Guichon, G. Guichon Ranch Ltd., Quilchena, British Columbia, Canada (V0E 2RO)

Filed Oct. 18, 1976, Ser. No. 733,111
Int. Cl.[2] B65H *17/46, 75/42*
U.S. Cl. 242—86.5 R **10 Claims**



1. A round bale feeder for transporting and unwinding round bales of hay or like material, the feeder including:

a. a wheeled frame carried on ground bearing wheels and adapted to be towed behind a vehicle,

b. a tilting frame hinged for rotation relative to the wheeled frame about a hinge axis disposed generally normally to direction of travel of the wheeled frame, the tilting frame having front and rear ends and a loading ramp at the rear end thereof,

c. front and rear rollers and a mid-roller positioned between the front and rear rollers, the rollers being journalled on the tilting frame for rotation about roller axes disposed parallel to the hinge axis so as to extend transversely across the tilting frame, at least one of the rollers being powered, the front and rear rollers being spaced apart longitudinally sufficiently to support a complete round bale thereon, the mid-roller being sufficiently close to one of the remaining rollers to support the bale when almost completely unwound,

d. tilting means cooperating with the tilting frame so that actuation of the tilting means rotates the tilting frame to lower the loading ramp towards the ground to permit the bale to be loaded onto the tilting frame and to position the rollers relative to each other to permit positioning of the bale on at least two rollers.

4,044,968

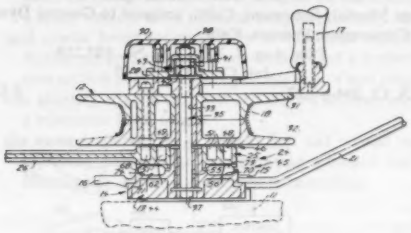
DOWNRIGGER FOR TROLLING

Blayney J. Scott, 306 Dallas Road, Victoria, British Columbia, Canada (V8V 1A7)

Filed Mar. 16, 1976, Ser. No. 667,257
Int. Cl.[2] A01K *89/02*
U.S. Cl. 242—106 **13 Claims**

1. A downrigger for trolling having: a reel adapted for winding a line thereonto and for unwinding a line therefrom; the reel being mounted for rotation about an axis and between a pair of spaced stop means; a brake means to brake the reel against rotation when engaged and to permit free wheeling of the reel when disengaged; and a cam means cooperating with the brake means and having a cam follower and a cam surface, the cam surface being characterized by:

a. a helical surface centered on the axis, the surface having location means thereon which holds the cam follower either in an off position in which the reel is free to rotate in either direction, or in cocked position in which rotation of the reel resulting from unwinding of the line actuates



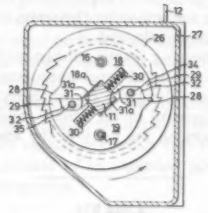
the cam means to engage the brake means to prevent further unwinding.

4,044,969

LOCKING MECHANISM FOR VEHICLE SAFETY BELTS

Jan-Olof Wallin, Mariefred, Sweden, assignor to Granges Essem Aktiebolag, Vasteras, Sweden

Filed Dec. 22, 1975, Ser. No. 643,117
Claims priority, application Sweden, Dec. 23, 1974, 7416264
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **4 Claims**



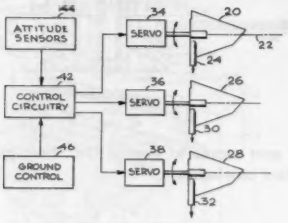
1. A locking mechanism for a retractable safety belt having a strap in a vehicle to lock the belt either at rapid retraction of the strap of the belt or at an alteration in travelling speed or direction of the vehicle, the mechanism comprising, in combination, a reel having an axis and on which the strap is coiled up when not in use; a supporting means attached to said reel for rotation with it; two pivot pins attached to said supporting means and positioned diametrically and at equal distances from and in parallel to said reel; at least two latching means pivotally mounted on said two respective pivot pins thereby to be turnable by centrifugal force from a retracted free position to an extended, latching position, said at least two latching means having substantially identical shapes, having respective notches and being positioned in a given plane perpendicular to said reel to abut one another in said plane whereby an angular turning of one of said at least two latching means causes a corresponding equal angular turning of the other of said at least two latching means; an actuating means rotatably mounted on said reel and provided with respective pins projecting into said respective notches in said at least two latching means so as to be driven by said at least two latching means upon rotation of said reel; and a movable inertia member for braking said actuating means in relation to said reel in response to an alteration of speed or direction of the vehicle, said actuating means when braked forcing said at least two latching means substantially simultaneously to the latching positions for locking said reel.

4,044,970

INTEGRATED THRUST VECTOR AERODYNAMIC CONTROL SURFACE

Inge Maudal, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Aug. 8, 1975, Ser. No. 603,218
Int. Cl.[2] F42B *15/18*
U.S. Cl. 244—3.22 **6 Claims**



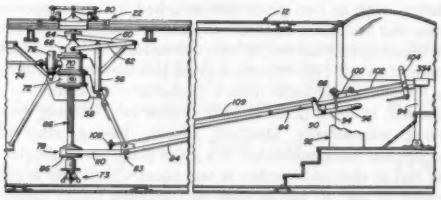
1. A missile comprising:
a cylindrical missile body;
main propulsion means acting along the axis of the body to propel the missile;
a plurality of tail panels pivotably mounted to and exteriorly of the body and pivotable about an axis normal to the cylindrical surface of the body, for aerodynamically controlling direction of the missile in flight;
a servo motor associated with each tail panel for controlling the angular position of the tail panel relative to the missile body;
control circuitry for activating the servo motors to control the flight of the missile; and
a continuously burning reaction thrust motor integral with and mounted in each tail panel and rotatable therewith for providing thrust along the chord thereof enhancing the aerodynamic control of the missile, and for developing rotational forces on the body in the absence of aerodynamic forces.

4,044,971

HIGH SPEED, LONG RANGE TURBO-JET AIRCRAFT

Jack W. Pharris, Alamogordo, N. Mex., assignor to Ruth Walcott, Albuquerque, N. Mex., a part interest

Continuation-in-part of Ser. No. 409,887, Oct. 26, 1973, Pat. No. 3,907,219. This application July 25, 1975, Ser. No. 599,106
Int. Cl.[2] B64C *27/22, 27/30*
U.S. Cl. 244—7 R **13 Claims**



1. A composite aircraft including a fuselage, a rotatable wing assembly, means mounting the rotatable wing assembly for rotation on the fuselage, thrust producing means mounted on the fuselage for propulsion thereof, disengageable drive means drivingly connecting said thrust producing means to the rotatable wing assembly for powered rotation thereof, means for retracting the rotatable wing assembly into the fuselage and means connected to the rotatable wing assembly for preventing retraction thereof in response to powered rotation.

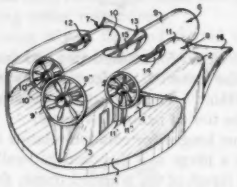
13. A convertible thrust and lift producing power plant for an aircraft comprising a combustion turbine having a combustion chamber and turbine blades, mechanical load means disengageably connected to the turbine blades, reaction nozzle means connected to the turbine for discharge of combustion products generated in the combustion chamber, compressor means driven by the turbine blades for inducing inflow of air to the turbine, after-burner means for conducting the combustion products from the turbine combustion chamber to the nozzle means, conduit means for conducting flow between the compressor means and the after-burner means in by-pass relation to the turbine, and means for supplying propellant fuel to the after-burner means while the turbine is unloaded from the load means, said propellant supplying means including means for selectively feeding rocket fuel and oxygen directly to the after-burner means during accelerating rocket operation and means for selectively feeding a refrigerant fluid to the conduit means during ram jet operation of the aircraft.

4,044,972

AIRCRAFT WITH CIRCULAR WINGS

Leif Anker-Holth, Munkedamsveien 55 b, Oslo 2, Norway

Filed Dec. 9, 1975, Ser. No. 639,103
Claims priority, application Norway, Mar. 24, 1975, 751010
Int. Cl.[2] B64C *15/14*
U.S. Cl. 244—12.2 **8 Claims**



1. In an aircraft an approximately circular lower aerofoil having a leading edge and a trailing edge, an upper at least partly circular aerofoil concentric with and of essentially the same diameter as said lower aerofoil and vertically spaced from said lower aerofoil; a central engine duct disposed generally in the plane of said upper aerofoil and having open forward and rear ends, said central duct extending along the longitudinal center line of the aircraft; means defining a central corridor extending along said lower aerofoil parallel to and directly under said central engine duct, said central corridor being continuous with and connected to both said aerofoils; at least two side engine ducts disposed parallel to and symmetrically on opposite sides of said central duct, said side ducts having open forward and rear ends; a vertical wall extending between each of said side ducts and said lower aerofoils; and propeller means mounted in each end of each duct for rotation about the axis of the respective duct.

4,044,973

NACELLE ASSEMBLY AND MOUNTING STRUCTURES FOR A TURBOFAN JET PROPULSION ENGINE

James R. Moorehead, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1975, Ser. No. 644,915
Int. Cl.[2] B64D *29/06*
U.S. Cl. 244—54 **14 Claims**

1. In a structure for mounting a turbofan engine on a aircraft fuselage, said turbofan engine having a high bypass ratio and including a turbine casing housing a turbine engine, the rearward end of a turbine nozzle operably associated with said turbine casing for directing propulsion gases rearwardly from said engine, an annular fan casing surrounding and spaced outwardly from said turbine casing, a low pressure fan mounted within said fan casing and driven by said turbine engine, said fan casing being structurally coupled to said turbine casing, an improved structure for interchangeably mount-

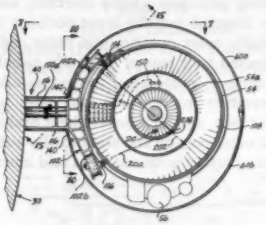
ing said turbofan engine to a plurality of locations on a fuselage comprising:

a structural yoke and means for affixing said yoke to the fuselage of an airplane, said yoke extending about a portion of the periphery of said fan casing and being spaced therefrom, said yoke having a central portion, a first end spaced in a first direction from said central portion and a second end spaced in the opposite direction from said central portion,

first shock absorbing mounting means associated with the first end of said yoke for releasably coupling the first end to a first location on the periphery of said fan casing,

second shock absorbing mounting means associated with the second end of said yoke for releasably coupling the second end of said yoke to a second location on the periphery of said fan casing, said second location being spaced from said first location,

a mounting arm and means for affixing said arm to the fuselage of an airplane, said arm having an outer end located adjacent said turbine casing and rearwardly from said yoke, said arm extending in a generally radial direction toward said turbofan engine,



third shock absorbing mounting means associated with the outer end of said arm for releasably coupling said outer end to said turbine casing,

nacelle means associated with said engine and including inner and outer fan duct walls defining an annular fan duct associated with and extending rearwardly from said fan casing for receiving fan air from said fan and directing said fan air rearwardly relative to said engine, and bifurcation means affixed to said engine and associated with said fan duct for splitting the flow of air therethrough, said bifurcation means extending longitudinally along said duct from a forward location adjacent said fan casing to a location rearwardly thereof, said bifurcation means being located in said fan channel adjacent the central portion of said yoke and having a central channel therethrough communicating between the region inside the inner fan duct wall and the region outside the outer fan duct wall, said mounting arm extending through said central channel, said nacelle means being coupled to said bifurcation means and said engine so as to be isolated from said mounting arm and said yoke when said engine is mounted thereon, and to remain coupled to said bifurcation means and said engine when said engine is released from said yoke and said mounting arm.

4,044,974

CLOSED CRADLE SPACE VEHICLE SUPPORT AND DEPLOYMENT SYSTEM

Richard C. Lingley, San Diego, and Milburn R. Smith, La Mesa, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 23, 1976, Ser. No. 716,735
Int. Cl.[2] B64D 9/00
U.S. Cl. 244—161 **6 Claims**

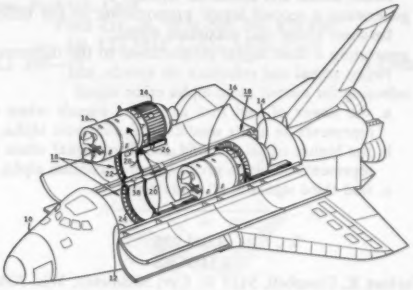
1. A support structure for carrying a spacecraft in a cargo bay of a reusable launch vehicle during launch and for deploying the space vehicle in outer space comprising:

a bi-sectional cradle having generally annular configuration, with an outer surface conforming generally to the inner surface of a reusable launch vehicle cargo bay and an inner surface generally conforming to the outer surface of a space vehicle to be released in space;

said cradle being longitudinally divided into a first fixed section secured to said launch vehicle and a second movable section adjacent to an openable side of said cargo bay;

one abutting edge of said first and second sections including a releasable latch means;

the second abutting edge of said first and second sections including a first hinge means having a hinged line lying substantially parallel to the cradle centerline;



first actuator means for rotating said second section about said first hinge from a closed cradle position to an open deployed position upon release of said latch;

deployment probe means for securing a space vehicle to said second section for rotation with said second section;

said deployment probe means including second hinge means having a hinge line lying substantially parallel to said centerline; and

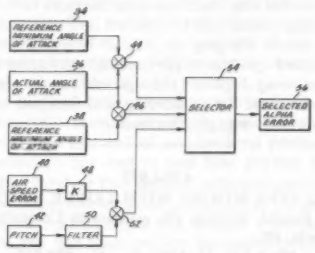
second actuation means for rotating said probe and any space vehicle secured thereto from a first position with said space vehicle in contact with the inner surface of said second section to an extended position extending away from said section.

4,044,975

AIRCRAFT SPEED COMMAND SYSTEM

Frederick C. Blechen, Long Beach, and Lloyd L. Roberts, Huntington Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 17, 1976, Ser. No. 687,256
Int. Cl.[2] G05D 1/08
U.S. Cl. 244—181 **8 Claims**



1. Apparatus for generating an angle of attack (alpha) error signal comprising:

means for generating a first signal proportional to a difference between a minimum angle of attack (alpha) and an actual alpha,

means for generating a second signal proportional to a difference between a maximum alpha and an actual alpha,
means for generating a third signal proportional to a difference between actual and reference aircraft speeds, and
selector means for transmitting as an output
a. the lower of said first and third signals when either represents an alpha less than minimum alpha,
b. the higher of said second and third signals when either represents an alpha greater than maximum alpha, or
said third means at all other times.

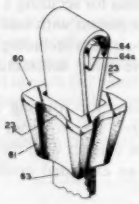
7. The method of generating an aircraft angle of attack (alpha) error signal, comprising:
generating a first signal proportional to the difference between actual and minimum alpha,
generating a second signal proportional to the difference between actual and maximum alpha,
generating a third signal proportional to the difference between actual and reference air speeds, and
selecting for output as an alpha error signal
a. the lower of said first and third signals when either represents an alpha smaller than minimum alpha,
b. the higher of said second and third signal when either represents an alpha greater than maximum alpha, or
c. said third signal at all other times.

4,044,976

CHOCKS

Gaylord K. Campbell, 5113 St. Cyr, Middleton, Wis. 53562

Division of Ser. No. 470,948, May 17, 1974, Pat. No. 3,957,237.
This application May 10, 1976, Ser. No. 685,079
Int. Cl.[2] A47G *29/00*
U.S. Cl. 248—1 **4 Claims**



1. A mountaineering chock comprising: a rigid body having a bottom surface, a first pair of opposed external side rock engaging surfaces tapering toward said bottom surface for engagement in a rock constriction, a second pair of opposed external side rock engaging surfaces tapering toward said bottom surface for engagement in a rock constriction, a constricted aperture for accommodating a runner with a runner egress opening on said bottom surface, removable anchoring means around which the runner is to be looped in said aperture, said aperture having an opening on one of said second pair of opposed external side rock engaging surfaces through which said anchoring means can be inserted into said aperture, said anchoring means wedging the runner looped therearound in said constricted aperture to prevent said anchoring means and runner from being displaced through said runner egress at said bottom surface and for reinforcing said first pair of opposed external side rock engaging surfaces.

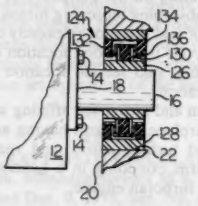
4,044,977

BUSHING TYPE MOUNT WITH TRIPLE SPRING RATE

Dennis D. Feucht, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 16, 1976, Ser. No. 677,576
Int. Cl.[2] F16C *35/12*
U.S. Cl. 248—7 **9 Claims**

1. In an isolation mount for absorbing shock loading including a stub shaft, mounting means providing at least a double spring rate including a first spring rate from substantially zero deflection to a first deflection limit and a second spring rate from said first deflection limit to a second deflection limit, said second spring rate being higher than said first spring rate, said second deflection limit being greater than said first deflection limit, wherein said mounting means comprises annular inner and outer bushings, said inner bushing having a diameter less than the diameter of said outer bushing and defining an annular space therebetween, said outer bushing having a radially inner face and said inner bushing having a radially outer face which define the radial limits of said space, an annular mounting ring intermediate said faces, said mounting ring defining a radially



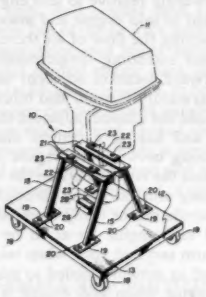
outer portion being generally axially directed, and a pair of generally axially directed radially inner portions on opposite sides of said radially outer portion, said outer and inner portions being connected by a pair of generally radially directed side walls, and further including a pair of annular, resilient outer bushing members intermediate said inner portions and said radially inner face, and an inner resilient bushing member intermediate said outer portion and said radially outer face, and wherein said outer portion is spaced from said inner face by an outer gap.

4,044,978

BOAT MOTOR DISPLAY AND WORK STAND

James F. Williams, 2004 Knollwood Drive, Grand Rapids, Minn. 55744

Filed May 10, 1976, Ser. No. 684,748
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—13 **6 Claims**



1. A stand for supporting boat motors comprising:
a base lying in a generally horizontal plane and having wheel means connected thereto;
means for supporting said boat motor on said base comprising connection means for connecting the stand to the cavitation plate of said boat motor on said each side of said motor and a support means extending between said base and said connection means for supporting said connection means in spaced relationship above said base;
said connection means including a pair of corresponding clamps spaced and adapted for straddling said boat motor, said clamps each including first and second clamp members being disposed one above the other and adapted for

clamping a portion of said cavitation plate therebetween, each of said first clamp members comprising a first elongated member positioned below its corresponding second clamp member and having a longitudinal axis extending generally in the direction of its elongated dimension and orientated such that its longitudinal axis is generally parallel to the longitudinal axis of the other first elongated member and generally equally spaced therefrom, each of said first elongated members further having an inner, top surface for engaging and supporting a portion of said cavitation plate along a substantial portion of the length thereof, each of said second clamp members being positioned in spaced relationship above said inner, top surface of its corresponding first elongated member, said connection means further including means connected with said first and second clamp members for providing a clamping action between said clamp members;

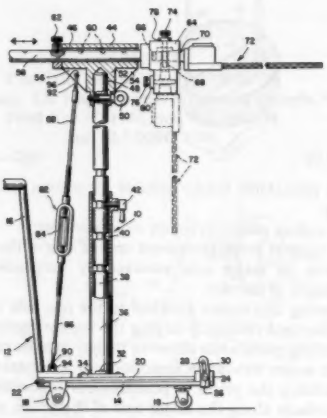
said support means including a support member connected with each of said first clamp members and extending outwardly and downwardly therefrom to said base to form an included angle with said generally horizontal plane of less than 90°.

4,044,979

HEDGE TRIMMER

Patrick V. Lemmo, 119 Scooter Lane, Hicksville, N.Y. 11801

Filed June 11, 1976, Ser. No. 695,150
Int. Cl.² F16F *15/00*; F16M *1/00*
U.S. Cl. 248—13 **6 Claims**



1. Hedge trimming apparatus comprising:

a base;

a substantially horizontal platform pivotally connected to said base so as to be adjustably positioned relative to said base;

means for retaining said platform in an adjusted position relative to said base, said retaining means comprising a block fixedly secured to an edge of said platform, a screw threadably received within an aperture disposed in said block, an arcuate arm fixedly secured to a lateral edge of said base adjacent to said edge of said platform, said arcuate arm having an arcuate slot disposed therein, said screw disposed through said arcuate slot and selectively engaging said arcuate arm upon the tightening of said screw;

wheel and handle means connected to said base;

a substantially vertical tubular pedestal on said base;

a column telescopically received and adjustably mounted in said pedestal;

a substantially horizontal tubular sleeve mounted on one end of said column;

a shaft slidably adjustable within said tubular sleeve; and

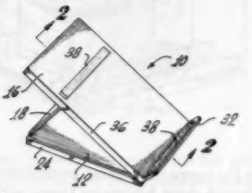
a bracket for mounting an electric hedge trimmer in either a vertical or horizontal position on the end of said shaft, said bracket having a first open-ended bore with a substantially horizontal longitudinal axis relative to said platform and a second open-ended bore with a substantially vertical longitudinal axis relative to said platform, said first and second bores for receiving a portion of said hedge trimmer therein.

4,044,980

COLLAPSIBLE DESKTOP STAND FOR PORTABLE ELECTRONIC CALCULATOR

Victor Cummins, Burbank, Calif., assignor to Cummins Enterprises, Burbank, Calif.

Filed Apr. 26, 1976, Ser. No. 679,980
Int. Cl.² F16F *15/00*; A47B *97/04*
U.S. Cl. 248—13 **4 Claims**



1. A collapsible one-piece stand for supporting a portable electronic calculator or the like on a work surface in inclined relation thereto, comprising:

a base portion formed by a thin rectangular plate having an upper and a lower surface extending in longitudinal and transverse directions, said upper surface having relatively short upstanding walls integrally formed along opposite end and side edges thereof for structural rigidity, said lower surface adapted to rest on said work surface and having means for resisting sliding movement therebetween;

a backrest portion comprising a thin rectangular plate adapted to hold said calculator thereon, said plate having a face surface and a rear surface extending in longitudinal and transverse directions, said face surface having a forwardly projecting, integrally formed flange extending transversely along a first end thereof to provide support underneath said calculator, and said rear surface having short rearwardly projecting, integrally formed side walls extending longitudinally along opposite side edges thereof, said side walls having at least one pair of rearwardly extending slots in register with each other near the end opposite said first end;

a brace portion comprising a thin rectangular plate extending in longitudinal and transverse directions having a first end and a second end, said second end of said brace portion having transversely projecting tabs extending beyond the side edges thereof;

said base portion, said backrest portion and said brace portion integrally formed as a single unit of a flexible plastic material, said first end of said backrest portion hingedly connected to one end of said base portion by a transversely extending thin integral web, and said first end of said brace portion hingedly connected to the opposite end of said base portion by a like integral web, said backrest portion and said brace portion swingable about the opposite ends of said base portion between at least one assembled state in which said brace portion engages said backrest portion for support thereof in an inclined position with said face surface facing outwardly and at least one collapsed state in which said backrest portion and said brace portion lie substantially flat with said base portion; and

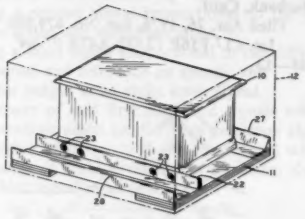
said tabs receivable within said slots with a snug fit for releasably fixing said brace portion to said backrest portion in an assembled state.

4,044,981

PAPERBOARD PALLET

Robert Horace Richter, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed June 14, 1976, Ser. No. 695,697
Int. Cl.[2] B60P *7/00*
U.S. Cl. 248—119 R **8 Claims**



1. A pallet for supporting cargo comprising:

a. a paperboard sheet having an upper surface and a lower surface;

b. an upstanding rib formed by folding said sheet so that adjacent strip portions of said lower surface are in facing relationship;

c. a base member beneath said sheet, the upper surface of said base member bonded to at least a portion of the lower surface of said sheet; and

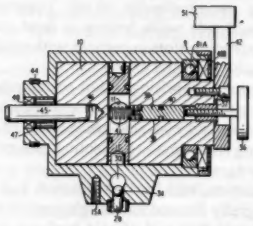
d. means for securing a cargo residing on said paperboard sheet to said upstanding rib.

4,044,982

SUPPORTS FOR CAMERAS

Jeanette Mary Miller, and Robert Eric Miller, both of Rose Bay, Australia, assignors to Victoria Alice Miller and Timothy Robert Miller, both of Rose Bay, Australia, part interest to each

Filed Oct. 18, 1973, Ser. No. 407,687
Claims priority, application Australia, Oct. 25, 1972, 967/72
Int. Cl.[2] F16M *11/12*
U.S. Cl. 248—183 **13 Claims**



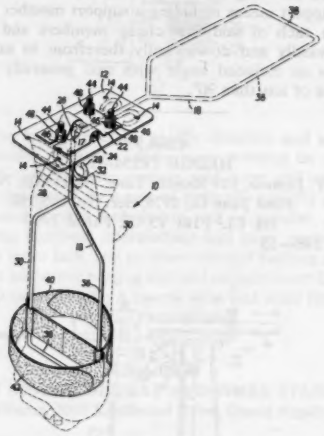
1. A fluid head support for rotating an apparatus supported thereon, said support comprising a casing having a substantially cylindrical bore therein, a cylindrical block, which is rotatable within said cylindrical bore, means permitting attachment of said apparatus to said fluid head support, sealing means to maintain a hydraulic fluid between the cylindrical surfaces of the casing bore and the block, said block being provided with a plurality of radial passages, an open end of each of said passages being located adjacent the cylindrical surface of the casing bore, each passage having a brake piston in sliding engagement therein, each said piston being located adjacent said open end of its respective passage, a control piston cylinder combination, means permitting fluid communication between the control piston-cylinder combination and the radial passages, means permitting displacemebt of the control piston and thereby causing radial displacement of the brake pistons relative to the cylindrical surface of the casing bore.

4,044,983

RETRACTABLE PLASMA CONTAINER HOLDER

Orville Francis, Piqua, Ohio, assignor to Indian Head, Inc., New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,419
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—293 **14 Claims**



1. A retractable holder suitable for plasma containers comprising:

a. a ceiling plate having an elongated slot;

b. a support prism positioned on one side of the ceiling plate with its major axis substantially perpendicular to the length of the slot;

c. spring clip means attached to the one side of the ceiling plate and resiliently urging the support prism against the ceiling plate while allowing the prism to be rotated around its major axis upon imposition of a substantial force for holding the prism in positions corresponding to the flat surfaces along the major axis of the prism; and

d. a hanger connected to the prism and including a portion extending through the slot to the other side of the ceiling plate, this portion of the hanger swinging back and forth along the length of the slot upon rotation of the prism and including means for supporting and restraining at least one container.

4,044,984

MOLD ASSEMBLY FOR RESIN-SEALING

Tsuyoshi Shimizu, Hinode, and Katsuhiro Tabata, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

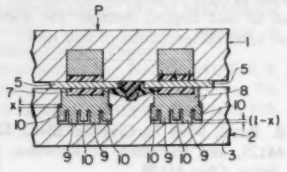
Filed Oct. 29, 1976, Ser. No. 737,038
Claims priority, application Japan, Oct. 29, 1975, 50-129206
Int. Cl.[2] B29C *6/00*
U.S. Cl. 249—95 **10 Claims**

1. In a mold assembly including a pair of upper and lower molds, said upper and lower molds having parting surfaces and clamping an object to-be-sealed between said parting surfaces so as to effect resin sealing of said object,

the improvement wherein each of said upper and lower molds comprises a cavity block and a holder formed with a concave portion for receiving said cavity block therein,

said cavity block of at least one of said upper and lower molds being formed with

a concave portion so as to define a mold space on the side on which it comes into contact with said object to-be-sealed,



protrusions for deformation projecting beyond a surface of said cavity block on a side on which it comes into contact with a bottom surface of said concave portion of said holders, and

grooves of a desired depth in said surface of said cavity block among said protrusions for deformation.

4,044,985

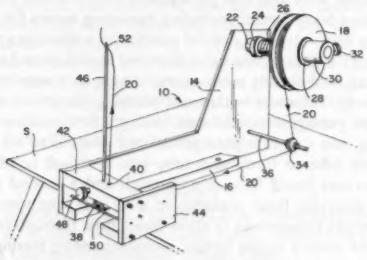
CANDLE MAKING APPARATUS

Michael Ghany, 120 Harbord Street, Toronto, Ontario, Canada

Filed Nov. 2, 1976, Ser. No. 738,032

Int. Cl.² B29C *1/00*

U.S. Cl. 249—205 **10 Claims**



1. Candle making apparatus comprising:

a wick dispenser including

a support

means on said support for rotatably mounting a spool containing a continuous length of wick material,

means on said support spaced from said spool for mounting a substantially vertical needle having an eye,

means on said support between said spool and needle for guiding said wick material from said spool through the eye of said needle, and

a candle mold holder including

a bottom clamping bar having a hole therethrough receiving said needle and threaded wick material,

a pair of upright guide rods on said bottom clamping bar, and

a top clamping bar slidably adjustable along said rods for cooperation with said bottom clamping bar for clamping a candle mold therebetween about said needle and threaded with material.

4,044,986

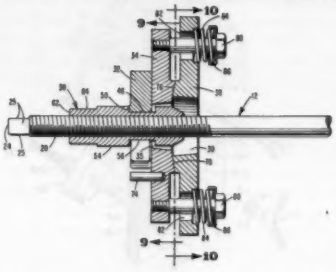
CONCRETE FORM PANEL TYING APPARATUS

James K. Strickland; Frank R. Capps, both of Jacksonville; Todd B. Nekola, South Ponte Vedra Beach, and William A. Fremer, St. Petersburg, all of Fla., assignors to Strickland Systems Inc., Jacksonville, Fla.

Filed May 12, 1975, Ser. No. 576,862

Int. Cl.² E04G *17/08*

U.S. Cl. 249—216 **39 Claims**



1. Concrete form panel tying apparatus for restraining outward movement of a concrete form panel with respect to a tie passing outwardly through a form opening in said form panel, said apparatus comprising:

a bearing member attachable to said form panel, said bearing member having an opening alignable with said form opening, and an outwardly facing first bearing surface,

a tie extending through said bearing member opening,

an outer end portion on said tie having a first transverse dimension,

an inner end portion on said tie located inwardly of said outer end portion and having a second transverse dimension less than said first transverse dimension,

an outwardly sloped tie surface extending between said outer end portion and said inner end portion, said outwardly sloped tie surface being arcuate in cross-section,

anchoring means for engaging said tie, said anchoring means being adjustably positioned between said sloped tie surface and said first bearing surface to compensate for misalignment of the tie with respect to the bearing member and comprising a clamping member and a second bearing surface engageable with said first bearing surface, said clamping member having a clamping member recess of transverse dimension greater than said second transverse dimension and less than said first transverse dimension, said clamping member recess being defined by an outwardly sloped clamping surface of arcuate cross-section complementary to said tie surface and engageable therewith, said clamping member being movable radially with respect to said tie between a clamping position wherein said clamping surface is in engagement with said tie surface to restrain said concrete form panel against outward movement with respect to said tie and a nonclamping position wherein said clamping surface and said tie surface are not engaged with one another.

4,044,987

EXTERNALLY CONTROLLED SPREADER SYSTEM

Dusan Tausanovitch, 24 Crestwood Drive, Northport, N.Y. 11768; Peter R. Lovisa, 1040 Pelhamdale Ave., Pelham, N.Y. 10803, and Tullio E. Lovisa, 91 Whitson Road, Huntington, N.Y. 11743

Continuation-in-part of Ser. No. 629,369, Nov. 6, 1975, which is a division of Ser. No. 525,887, Nov. 21, 1974, Pat. No. 3,920,214.

This application Nov. 3, 1976, Ser. No. 738,549

Int. Cl.² E04G *17/00, 11/06*

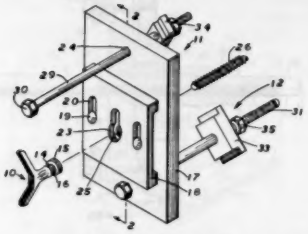
U.S. Cl. 249—219 W **15 Claims**

1. An exterior spreader system for a threaded end tie rod to

provide for controlled adjustment of concrete forms in both directions lengthwise of the tie rod, comprising:

a. nut means internally threaded for engagement with the adjacent end of the tie rod, said nut means having an inner end and other end and having a groove in the side thereof defined partly by a flange at the inner end;

b. a plate washer assembly incuding a washer adapted to be secured to a form and including a slidable plate slidably coupled to the exterior of the washer and defining therewith a recess, the plate having a through hole receiving the flange therethrough for disposition within the recess,



the plate being shiftable from a first disengaged position at which the flange is adapted to be inserted through the through hole into the recess and a second locked position at which the flange is locked within the recess and consequently the nut means is locked relative to the plate-washer assembly by the disposition of surfaces of the plate within said groove establishing a driving relation between said nut means and said plate-washer assembly; and

c. whereby threaded movement of said nut means on the tie rod will be transmitted through said flange and said plate-washer assembly to the form to which said washer is secured.

4,044,988

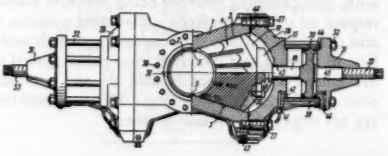
BLOWOUT RAM PREVENTER

Suren Akopovich Arzumanov, ulitsa Bogdana Khmelnitskogo, 2/15, kv.44, Moscow; Armais Avakovich Danieliants, ulitsa Nizami, 66, kv. 52, Baku; Kerim Salim ogly Aliverdizade, ulitsa Nizami, 66, kv. 19, Baku; Gasan Neimat ogly Seidov, ulitsa Chapaeva, 102, kv. 57, Baku; Artur Tair ogly Rasi-Zade, Tbilissky prospekt, 1 mikroraion, A-2, kv. 63, Baku; Boris Ovseevich Frenkel, ulitsa Chapaeva, 66, kv. 10, Baku, and Jury Alexandrovich Samoilov, ulitsa Nakhichevanskogo, 18, kv. 85, Baku, all of U.S.S.R.

Filed July 11, 1975, Ser. No. 595,218

Int. Cl.[2] E21B *33/06*

U.S. Cl. 251—1 A **4 Claims**



1. A blowout ram preventer, comprising: a housing having opposite ends, said housing being provided with a longitudinal cavity and a transverse central bore; guides in the cavity of said housing, the transverse spacing between said guides decreasing uniformly in a direction from the ends of said housing towards said bore, said guides adjacent said bore being spaced a distance at least equal to the diameter of said bore; a pair of opposed rams slidably mounted in said cavity for undergoing reciprocal movement relative to said bore, each said ram including a packer of resilient material having one end with reinforcing members therein facing said bore, and a ram body engaging said packer at the opposite end thereof, said ram body being slidably engaged with said guides, said guides and said ram body confining said packer so that the material of the packer will flow upon reciprocation of the ram, said ram body including a central drive member and two side members which are L-shaped in cross section and are movably coupled to each other and to said central member for undergoing relative movement upon reciprocation of said ram.

4,044,989

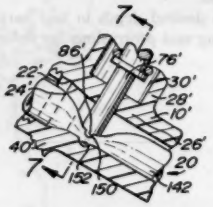
PINCH TUBE VALVE

Donald R. Basel, 9006 McCracken Blvd., Garfield Heights, Ohio 44125, and Raymond P. Kawolics, 6421 Woodbury Drive, Solon, Ohio 44139

Continuation of Ser. No. 508,208, Sept. 23, 1974, Pat. No. 3,976,277. This application Feb. 17, 1976, Ser. No. 658,195

Int. Cl.[2] F16K *7/06*

U.S. Cl. 251—7 **6 Claims**



1. A pinch tube type valve adapted to receive an elongated flexible tube for selective control of liquid through said tube, said valve comprising;

a valve body having upper and lower surfaces, an inlet end, and outlet end, a first enclosed passageway interconnecting said inlet and outlet ends and a second enclosed passageway disposed generally transversely to and communicating with said first passageway between said ends, said valve body further including mounting means for mounting said valve in a desired position to a mounting surface;

means for closing said valve disposed in said second passageway, said closing means comprising a stem member selectively reciprocal within said second passageway into said first passageway, said stem having a first position extending into said first passageway and adapted to act against said tube to force said tube into a closed condition to prevent liquid flow therethrough and a second position withdrawn from engagement with said tube toward said second passageway to allow liquid flow through said tube, said closing means further including spring biasing means disposed in said second passageway operating against said stem to continuously urge said stem toward said first position; and,

a distinct tube engaging protrusion extending outwardly from the outermost end of said stem wherein said protrusion has a width dimension as measured generally transverse of said first passageway and a thickness dimension as measured generally normal to said width dimension, said width being generally equal to the lateral dimension of said stem outermost end with said thickness being less than said width such that said protrusion comprises a generally rib-like area disposed transverse of said first passageway, said protrusion being cooperable with a distinct protrusion receiving area in the side wall of said first passageway opposite said second passageway with said receiving area having generally the same configuration as said protrusion and extending generally transversely across said first passageway whereby when said stem is in said first position, said distinct tube engaging protrusion engages said tube to force a portion thereof at least slightly into said

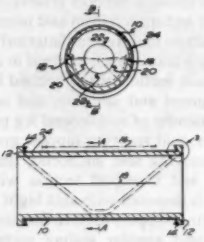
distinct protrusion receiving area for more tightly closing said tube.

4,044,990

FLEXIBLE TUBULAR MEMBERS AND VALVES INCORPORATING SUCH MEMBERS

Francis Summerfield, Leeds, England, assignor to Alvasum (Aseptic) Limited, Pudsey, England

Continuation-in-part of Ser. No. 330,661, Feb. 8, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,369
Claims priority, application United Kingdom, Feb. 18, 1972, 7560/72; Feb. 22, 1972, 8011/72
Int. Cl.[2] F16K 7/06
U.S. Cl. 251—8 5 Claims



1. A flexible tubular member of circular cross section over an axial region between the ends thereof and having opposing shoulders at said region which divide the tube section at the shoulders into a first portion and a second portion which includes the shoulders, the circumferential internal length of the first portion being equal to the circumferential internal length of the second portion so that the tube can be pinched closed by a wrapping of the first portion into the second portion and over the shoulders, while the flexible tubular member is held in a rigid tube neatly matching the outside diameter of the flexible tubular member, said shoulders tapering away to nothing in the axial directions away from the center of the region, and wherein the tubular member in cross section is of constant thickness to one side of the shoulders defining a thick tube portion, and of constant thickness to the other side of the shoulders defining a thin tube portion and said thick and thin portions may each extend circumferentially over approximately half of the wall sectional length.

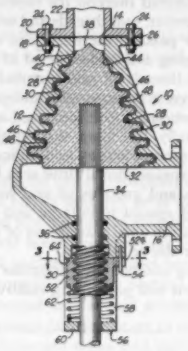
4,044,991

HIGH ENERGY LOSS FLUID FLOW CONTROL DEVICE

Henry A. Waller, Woodland Hills, Calif., assignor to Consolidated Controls Corporation, Bethel, Conn.

Filed Oct. 6, 1975, Ser. No. 619,709
Int. Cl.[2] F16K 47/06
U.S. Cl. 251—122 17 Claims

1. A high energy loss fluid flow control device comprising:
a housing member having an annular wall with an inlet adjacent one end and an outlet adjacent another end.
said housing wall having an inside surface formed with a continuous helical land and groove defining at least a part of a continuous helical flow passage between said inlet and outlet,
a valve member mounted in said housing for movement toward and away from said inlet and having an outer surface formed with a continuous helical land and groove defining at least a part of said helical flow passage extending between opposite ends of said member,
said land of said valve member projecting into said groove in said housing and said land of said housing wall projecting into said groove in said valve member forming said helical flow passage, and
means independent of said lands and grooves supporting said valve member in said housing for relative rotation and linear movement toward and away from said inlet to lengthen and shorten said continuous flow passage without contact between opposite facing surfaces of said lands projecting into said grooves,



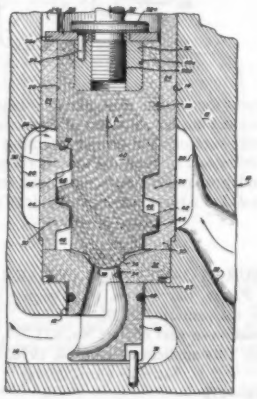
said supporting means including a spindle secured to said valve member and having a threaded portion supported from said housing in threaded engagement with a support member movably mounted thereon.

4,044,992

HIGH ENERGY LOSS FLUID FLOW CONTROL DEVICE

David Jukoff, Northridge, Calif., assignor to Consolidated Controls Corporation, Bethel, Conn.

Filed Jan. 9, 1976, Ser. No. 647,906
Int. Cl.[2] F16K 47/06
U.S. Cl. 251—126 6 Claims



1. A high energy loss fluid flow control device comprising:
a body defining a generally cylindrical chamber in communication with an annular fluid inlet passage around said chamber spaced axially of a fluid outlet passage at one end of said chamber;
a hollow tubular generally cylindrical sleeve member coaxially mounted in said chamber open at one end adjacent said outlet passage and formed with a helical internally projecting thread extending between said one end and a radial inlet opening formed in the wall of said sleeve member in communication with said annular fluid inlet passage, and a helical groove formed between adjacent turns of said thread; and
a valve member coaxially mounted in said tubular sleeve

member for axial translation relative thereto and including an outwardly projecting helical thread extending between an end of said valve member and extending into said helical groove of said tubular sleeve member, and a helical groove defined on said valve member between adjacent turns of said thread thereon for receiving said thread of said sleeve member, said threads and said grooves defining a helical flow passage therebetween extending between said inlet opening and said one end of said tubular sleeve member, said threads of said members having a similar shape in transverse cross-section and each having a transverse cross-sectional width measured axially of said members substantially less than the width of said grooves receiving the same whereby said helical flow passage has a transverse cross-sectional flow area between said interfitting threads and grooves of said members of variable dimension and spaced to enlarge and contract said flow area upon relative axial translation of said valve member in said tubular sleeve member,

and means keying said members together permitting relative axial movement and preventing relative rotation therebetween.

4,044,993

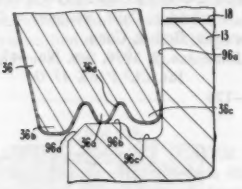
HIGH VACUUM GATE VALVE

William R. Wheeler, Saratoga, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 452,110, March 18, 1974, Pat. No. 3,973,753. This application Jan. 26, 1976, Ser. No. 652,038

Int. Cl.[2] F16K *25/00, 51/02*

U.S. Cl. 251—158 **11 Claims**



1. Apparatus for valving comprising a valve member having a circular sealing surface, a sealing ridge extending outwardly from the said surface, a pair of protecting ridges extending outwardly from said surface, the sealing ridge being positioned between said protective ridges, and said sealing ridge being radially inward of a plane across said pair of protecting ridges.

4,044,994

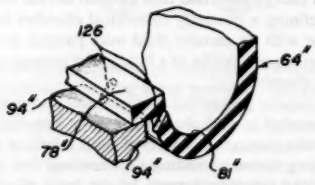
PRESSURE LOADED SEALING ARRANGEMENT

Werner K. Priese, Barrington, Ill., assignor to Hills-McCanna Company, Carpentersville, Ill.

Continuation-in-part of Ser. No. 421,777, Dec. 5, 1973, abandoned. This application Oct. 14, 1976, Ser. No. 622,387

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—172 **8 Claims**



1. A valve comprising, in combination, a first element constituting a valve body defining a flow passage extending therethrough, a second element constituting a flow control member movably supported relative to said body for movement between an open position and a closed position for opening and closing said flow passage, one of said elements defining an annular sealing surface, the other of said elements defining an annular seal ring support groove oriented to confront said sealing surface in close proximity thereto; an annular seal ring member disposed in said support groove, said seal ring member, in section, including a first leg portion providing an annular anchoring flange, and a second leg portion including, an intermediate section extending in a direction toward said sealing surface as a continuation of said first leg portion, a reverse bent, bight segment of an arcuate shape joined to said intermediate section and extending radially outward of said support groove, said bight segment being joined with a free end segment which extends into said support groove oppositely of said intermediate section and spaced from said intermediate section, and lip means formed on said free end interiorly of said support groove and extending transversely thereof in a direction away from said intermediate section of said second leg portion, such that said bight segment and said free end segment serve to define with the remainder of said second leg portion and interior plenum chamber; said seal ring support groove including a first section for receiving said anchoring flange in fixed engagement therein, and a second section within which said second leg portion is disposed with said bight segment extending from said seal ring support groove for confronting sealing engagement with said annular sealing surface, said second section of the seal ring support groove being defined by spaced apart side surfaces, one of said surfaces defining shoulder means extending axially inward of said groove upon which said transversely extending lip means is engaged to maintain the free end of said second leg portion in said groove and to define the limit of the extension of said bight segment from said support groove, said bight segment extending from said groove a sufficient distance such that upon the engagement of said bight segment with said annular sealing surface upon movement of said flow control member to the valve closed condition, said second leg portion will be moved inwardly of said annular seal support groove to disengage said lip means from said shoulder means a sufficient amount to allow line fluid to enter said seal support groove and said plenum chamber, thereby to pressurize said seal, said sealing surface on said one element being disposed in close proximity to said confronting support groove in said valve closed condition, with the side surface of said support groove opposite said side surface having the shoulder means formed thereon, being disposed to form with said sealing surface an annular substantially right angle caulking corner, such that due to the close proximate of said sealing surface and said groove, and the provision of said caulking corner, upon said seal being pressurized, line pressure will force said bight segment into said caulking corner, with portions of said bight segment being forced into sealed engagement with said side surface and sealing surface defining said annular caulking corner, and means providing one or more passageways connecting the interior of said second section of said ring support groove with said flow passage such that fluid can escape from said plenum chamber even though said lip is engaged with said shoulder means.

4,044,995

VALVE

Yasuna Kubota, Kunitachi, Japan, assignor to Taimei Kinzoku Kabushiki Kaisha, Tokyo, Japan

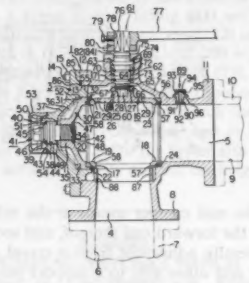
Filed July 21, 1976, Ser. No. 707,403

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—188 **1 Claim**

1. An angle ball valve characterized by comprising a valve casing which consists of a main body and a cover member mounted detachably to said main body which has a first flow passage and a second flow passage, each passage being positioned in an angle state, said cover member having a seat holder fitted slidably in its seat holder fitting hole and an ad-

justing spindle fitting hole at its boss portion, said seat holder having a female screw hole at its boss portion, a valve member which is provided within the valve casing and which has an inlet port communicated always with the first flow passage, an outlet port capable of communicating with the second flow passage, a valve stem fitting hole, and a contacting surface provided around said valve fitting hole; seat rings fitted in the valve casing to support the valve member, one seat ring being fitted in the main body, and another seat ring being fitted in the seat holder; a valve stem arranged at the opposite side to the first flow passage and fitted in the valve stem fitting hole of the valve member at its lower portion, said valve stem being able



to rotate the valve member along the axis of the first flow passage; a receiving member mounted on the valve stem which is adjustably and movably engaged with the contacting surface of the valve member at its lower end surface so that the receiving member may receive a partial load to be applied on the valve member; and an adjusting spindle engaged in the female screw hole of the seat holder in its male screw portion and also fitted in the adjusting spindle fitting hole of the cover member so as to rotate merely without moving in the axial direction, whereby it is possible to compensate the contacting state between the seat rings and the valve member by the adjusting movement of the seat holder through the rotation of the adjusting spindle.

4,044,996

VALVE MEANS

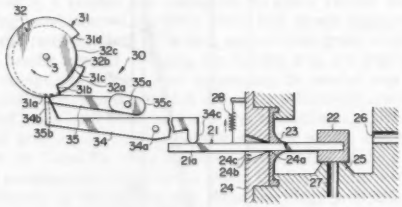
Heiichi Kodaira, Kitahara 3-2-18, Tanashi, Tokyo, Japan

Filed Oct. 14, 1975, Ser. No. 622,174

Claims priority, application Japan, Oct. 16, 1974, 49-123910[U]; Nov. 5, 1974, 49-132993[U]

Int. Cl.[2] F16K *31/524*

U.S. Cl. 251—229 **8 Claims**



1. A valve means comprising:

a valve lever pivotably supported by a valve guide and having a valve disk at one end thereof,

a seal of flexible material sealing the supporting portion of said valve guide and supporting said valve lever;

said seal being formed integral with said valve disk and covering a portion of said valve lever, and

a cam mechanism comprising:

a first cam having a cam surface of a high portion and low portion;

a second cam rotatable integrally with said first cam and having

a cam surface formed as a curved surface;

the distance of said curved surface from the center of rotation of said second cam being varied gradually from the highest portion toward the lowest portion of said cam surface;

a first lever pivotably supported by a shaft and biased so that one end thereof is pushed against said cam surface of said first cam, and

a second lever pivotably supported by another shaft and biased so that one end thereof is pushed against said cam surface of said second cam;

said valve means being arranged to integrally rotate both of said first and second cams so that said valve disk is opened when said one end of said first lever drops from said high portion to said low portion of said first cam as the other end of said first lever operates said valve lever and that said valve disk is closed when said one end of said second lever drops from said highest portion to said lowest portion of said second cam as said second lever pushes said first lever to return said first lever to the original position;

said seal being deformed when said valve lever is operated.

4,044,997

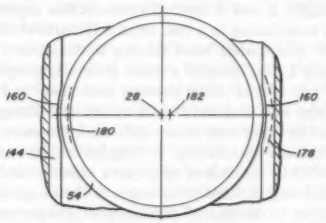
SEAT RING NOTCH FOR GATE VALVE GUIDE RAIL

Thomas A. Schelat, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1976, Ser. No. 721,947

Int. Cl.[2] F16K *3/12, 27/00*

U.S. Cl. 251—328 **6 Claims**



1. A gate valve comprising: a valve body having a flow passage intersected by a cavity; an annular valve seat member of predetermined diameter and height receivable within a bore formed in the passage adjacent the cavity; gate means having annular surfaces engageable with the valve seat member in a closed position and spaced therefrom in an open position; tongue means along the sides of the gate means; rail means formed on opposite sides of the body along the cavity and having spaced guide surfaces defining grooves for receiving the tongue means to guide the gate means in moving between said positions, said grooves having a width greater than the predetermined height of said valve seat member, the spacing between rail means on said opposite sides being less than said predetermined diameter; and notch means in the rail means in the rail means defining an opening toward the bores larger than said predetermined diameter whereby said valve seat member can be positioned into the bore by lowering the valve seat member into the cavity between said guide surface, aligning the valve seat member with the notch means, and shifting the valve seat member through said notch means into said bore.

4,044,998

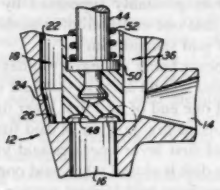
WEB TIP SEAT CUP

Elroy J. Giese, deceased, late of Cleveland, Ohio, by Alice F. Giese, executrix, assignor to Tomlinson Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 300,450, Oct. 25, 1972, Pat. No. 3,904,174. This application May 27, 1975, Ser. No. 580,630

Int. Cl.[2] F16K *7/12*

U.S. Cl. 251—331 **5 Claims**



1. A valve comprising:

a valve body having a cylindrical valve chamber connected with a lateral inlet passage and an axial outlet passage;

a valve seat formed in said chamber about said outlet passage, said valve seat being flat and lying in a plane generally perpendicular to the axis of said outlet passage;

a stem member extending generally axially into said valve chamber and selectively movable between valve opened and closed positions; and,

a resilient, cylindrical, generally cup-shaped valve member positioned in said valve chamber in operative communication with said stem member for movement between valve opened and closed positions and having an end face adapted to engage said seat and a peripheral side wall sealingly engaged with the inner wall of said chamber at a location axially spaced from said inlet, the end face of said valve member including a sealing portion in the form of a resilient peripheral downwardly extending flange having a length L and a tapered cross-section tapering toward and terminating in a flat, relatively narrow, circumferentially continuous band having a thickness D less than length L and lying in a plane generally perpendicular to the axis of said outlet passage with said band adapted to engage said seat about said outlet, said flange being defined by inner and outer walls with the outer wall being cylindrical and having its longitudinal axis substantially parallel to the axis of said valve chamber and said inner wall being inclined at an angle in the range of 20° to 40° relative to the axis of said chamber, the cooperative relationship between said stem and valve member being such that said continuous band of said flange positively engages said valve seat to form a sealing relationship therewith when said valve is in said closed position with said flange being axially compressed and at least slightly radially expanded, whereby fluid entering said chamber through said inlet passage will act against the at least slightly radially expanded area of said flange to further force said band into engagement with said valve seat and further enhance the effective sealing relationship therebetween.

4,044,999

CAMPER JACK

John N. Dodgen, Humboldt, Iowa, assignor to Dodgen Industries, Inc., Humboldt, Iowa

Filed Oct. 29, 1976, Ser. No. 736,695

Int. Cl.[2] B66F *7/26*

U.S. Cl. 254—45 **3 Claims**

1. In combination,

a truck including a frame means having rearward and forward ends, a bed means operatively secured to said frame means and having opposite sides,

a camper means mounted on said bed means and including rearward and forward ends and opposite sides,

a first jack means having upper and lower ends and being length adjustable from first to second positions, the upper end of said first jack means being selectively movably secured to said camper means at one side thereof adjacent the forward end thereof, said first jack means being laterally adjustable from a travel position closely adjacent said one side to a support position outwardly therefrom,

a second jack means having upper and lower ends and being length adjustable from first to second positions, the upper end of said second jack means being selectively movably

secured to said camper means at the other side thereof adjacent the forward end thereof, said second jack means being laterally adjustable from a travel position closely adjacent said other side to a support position outwardly therefrom,

and means on said frame adapted for connection to the lower ends of first and second jack means to detachably hold said first and second jack means in said travel positions,

said first and second jack means normally having their upper ends positioned below the lower forward end of said camper means, when in said travel position, and normally dwelling in a vertical plane inwardly of the sides of said camper means when in said travel position.

4,045,000

RACK JACK

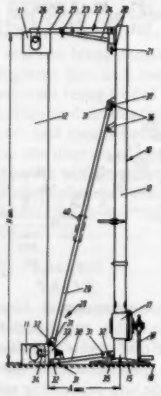
Erich Mai, Kirschfurt, Germany, assignor to Firma Josef Haamann, Hebe-und Transporttechnik, Freudenberg, M.-Kirschfurt, Germany

Filed Sept. 7, 1976, Ser. No. 720,807

Claims priority, application Germany, Sept. 11, 1975, 2540400

Int. Cl.[2] B66F *7/26*

U.S. Cl. 254—45 **8 Claims**



1. Rack jack for hoisting, lowering and/or supporting containers, cabins, shelters, exchangeable superstructures or the like, having upper and lower corner fittings, said rack jack comprising an upwardly extending jack shaft **(13)**, means for

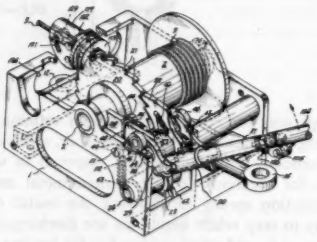
moving said jack shaft upwardly, an upper arm (22) mounted on the jack shaft and having an engaging part (26) at its outer end for engaging an adjacent upper corner fitting, a lower arm (28) mounted on the jack shaft and having an engaging part (34) at its outer end for engaging an adjacent lower corner fitting, each of said arms comprising a pair of supporting rods of different length connected at their inner ends to the jack shaft and at their outer ends to the engaging parts, the engaging part (26) for the upper corner fitting being adjustable substantially parallel to the axis of the jack shaft and substantially transversely to the jack shaft axis, and the engaging part (34) for the lower corner fitting being adjustable substantially perpendicularly with reference to the jack shaft axis, characterized in that the two rods (29, 30) of the lower arm (28) that is associated with a lower corner fitting (11) are articulatedly connected respectively with the jack shaft (13) and the engaging part (34), and in that the longer rod (29) in the working position runs obliquely against the jack shaft (13), the jack shaft is provided with a plurality of mutually spaced articulation points (36) in the upper half thereof to which the inner end of the longer rod (29) may be connected, and in that the total length of the two rods, (29, 30) of the lower arm (28) does not exceed, or does not substantially exceed, the height of the jack shaft (13).

4,045,001

PUMPING RATCHET WINCH

Thomas G. Harvey, Jr., 2385 Bossert Ave., Kamloops, British Columbia, Canada V2B 4V6

Filed July 10, 1975, Ser. No. 594,585
Int. Cl.[2] B66D *1/00*
U.S. Cl. 254—164 **21 Claims**



1. In a ratchet winch including a drum for hauling a line, a frame mounting the drum for rotation, ratchet means for rotatively driving the drum relative to the frame and having a ratchet wheel, a drive pawl engageable with the ratchet wheel to drive it, a ratchet arm swingable to effect ratchet wheel rotating movement of the drive pawl, stop means engageable with the ratchet wheel to hold it against retrograde rotation and a handle arm for swinging the ratchet arm, the improvement comprising a hinge joint connecting the ratchet arm and the handle arm, and conversion means for selectively converting said hinge joint between a stiff arm condition in which the ratchet arm is swingable conjointly with the handle arm relative to the frame for effecting high-speed rotation of the drum and a pumping arm condition in which the handle arm is rockable relative to the ratchet arm about the hinge joint axis for swinging the ratchet arm incrementally relative to the frame through an angle much smaller than the angle of swing of the handle arm relative to the frame for effecting high-power rotation of the drum.

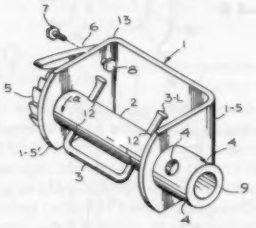
12. In a winch including a drum for hauling a line, a frame mounting the drum for rotation and means for rotatively driving the drum relative to the frame, the improvement comprising a tie slidably connected to the frame, bridging the frame and having one end connected to one end of the line, the other end of the line being connected to the drum and a portion of the line between its ends being connected to a load, anchor-connecting means connecting the other end of said tie to a fixed anchor remote from the frame, said tie thereby transmitting tension between such load and such anchor bypassing the frame, and frame-connecting means for connecting the frame and said tie for providing relative movement of said frame and said tie, said frame-connecting means including abutment means interengaged between the frame and said tie.

4,045,002

MULTI-PURPOSE LOAD WINCH

Errol S. Miller, 14500 S. McNab, No. 413, Bellflower, Calif. 90706

Filed Apr. 14, 1975, Ser. No. 568,137
Int. Cl.[2] A63B *61/04*
U.S. Cl. 254—164 **10 Claims**



1. An improved load tensioning winch apparatus adapted for tensioning engagement with a wide variety of load binders and comprising:

mandrel means comprising a cylindrical tube mounted rotatably on a relatively fixed frame means and including drive engagement means for accommodating selective rotation thereof together with rotation limit means for selectively limiting mandrel rotation to one direction; said cylindrical tube which is so perforated, being nonetheless otherwise substantially continuous and solid along its binder-engaging periphery; and

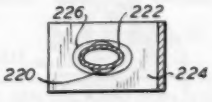
binder coupling means including minor perforate means through said mandrel means, this coupling means being adapted to be loosely engaged with the end of said binders, accommodating both straps and strand binders, and being translateable toward and away from said periphery, whereby, when said binder coupling means is translated toward said binder periphery, said strap is wound about said binder coupling means and said binder periphery, thereby coupling said strap to said binder.

4,045,003

SUPPORT DEVICES FOR STANCHIONS

John R. McCluskey, and Ralph R. Edwards, both of P.O. Box 68, Hannacroix, N.Y. 12087

Continuation-in-part of Ser. No. 341,131, March 14, 1973, abandoned. This application Apr. 19, 1974, Ser. No. 462,314
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—59 **5 Claims**



1. Means for securing a stanchion, wherein the stanchion being of the type which may be secured or released by rotation with respect to a work surface, said securing means comprising:

a. stanchion means; and

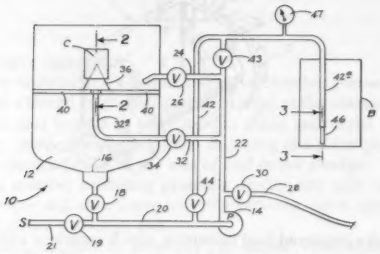
b. member means secured to said stanchion and movable with respect thereto such that with said member means being in a first position with respect to said stanchion, said member means being substantially rotable with respect to said stanchion means; with said member means being in a second position with respect to said stanchion, said member means upon rotation with respect to said stanchion engaging a predetermined part of said stanchion to thereby turn said stanchion.

4,045,004

CHEMICAL MIXING AND PUMPING APPARATUS

Henry F. Berger, 402 N17, Springfield, Oreg. 97477

Filed Oct. 1, 1976, Ser. No. 728,509
Int. Cl.[2] B01F *15/00*
U.S. Cl. 259—4 R **14 Claims**



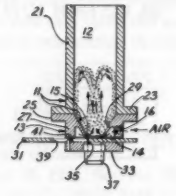
1. Apparatus for commingling liquids comprising
reservoir means for receiving and holding liquid;
drain valve means operable for selectively permitting liquid to be withdrawn from said reservoir means;
means disposed adjacent to said reservoir means for impaling a container to permit the container's liquid contents to flow into said reservoir means; and
pump means operable for transporting liquid from an external supply and a supply conduit into said reservoir means, said pump means also being operable for recirculating liquids from said reservoir means through said drain valve means and back into said reservoir means to thereby thoroughly mix the liquids, said pump means being further operable for discharging liquids so mixed away from said reservoir means.

4,045,005

BLENDING DEVICE

Dwight E. Davis, Escondido, and Stephen J. Foster, San Diego, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Dec. 13, 1974, Ser. No. 532,314
Int. Cl.[2] B01F *13/02*
U.S. Cl. 259—36 **9 Claims**



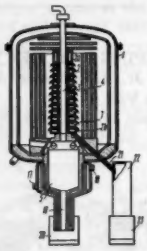
7. A blending device for providing a uniform mix of particulate material, comprising, wall means defining a mixing chamber and including a cylindrical upper section on a vertical axis and a frustoconical lower section terminating in a lower orifice, a slidable plate positioned perpendicular to the axis of said frustoconical lower section and spaced a distance therefrom to define a slit communicating with the interior of said mixing chamber at the bottom thereof, means defining with said slidable plate a plenum surrounding said frustoconical lower section, and means for conducting pressurized fluid to said plenum to discharge through said slit for agitating particulate material contained in said mixing chamber.

4,045,006

APPARATUS FOR CONTINUOUS VACUUM-REFINING OF METALS

Vladimir Semenovich Cherednichenko, ulitsa Zorge, 269, kv. 79, Novosibirsk; Valentin Innokentievich Belsky, ulitsa Zorge, 70, kv. 6, Novosibirsk; Gennady Ivanovich Orlov, ulitsa Vatutina, 27, kv. 20, Novosibirsk; Jury Anatolievich Naryshkin, ulitsa Bljukhera, 7, kv. 55, Novosibirsk, and Jury Petrovich Novikov, Leninsky prospekt, 30, kv. 19, Moscow, all of U.S.S.R.

Filed July 31, 1975, Ser. No. 600,864
Int. Cl.[2] F27B *17/00*; **F27D** *7/06*
U.S. Cl. 266—149 **7 Claims**



1. Apparatus for continuous vacuum refining of a metal comprising a cylindrical vacuum chamber, a stack of a plurality of vertically superposed trays disposed in said vacuum chamber for receiving impure molten metal and including interconnection means for flowing the metal downwardly from tray to tray while impurities are discharged therefrom, heater means in said vacuum chamber for heating of the metal in the trays and for evaporating the impurities therefrom, shield means in said chamber surrounding said trays for trapping volatilized impurities discharged from the trays and for condensing and discharging the impurities, and means for effecting irregular distribution of heat energy generated by the heater means along the height of the stack of trays such that the heat energy imparted to the trays diminishes in a vertically downwards direction.

4,045,007

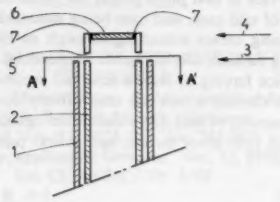
BLAST PIPE FOR METALLURGICAL CONVERTERS

Pierre Leroy, Saint-Germain-en-Laye, and Emile Sprunck, Moyeuvre-Grande, both of France, assignors to Emile Sprunck, Moyeuvre-Grande, France

Filed June 1, 1976, Ser. No. 691,435
Claims priority, application France, June 25, 1975, 75.19843
Int. Cl.[2] C21C *5/48*
U.S. Cl. 266—268 **4 Claims**

1. A blast pipe apparatus for a metallurgical converter comprising: a plurality of concentric tubes, including first and second tubes, the cross-sections of said tubes being adapted to fluid flows required for the refining of a metal bath, the first outermost tube of which is to be fed with a combustible fluid; the second tube, adjacent to said first tube, which defines on the inside, an annular combustible fluid passage and which is to be fed with gas to complete the combustion; said second tube extending beyond said first tube at the end of the blast pipe,

being provided with a row of orifices arranged in a crown solely in the projecting portion of the said second tube and



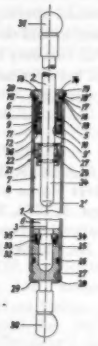
having its end closed by a metal cap soldered thereto by means of a hard solder which melts at a predetermined temperature.

4,045,008

GAS SPRING

Fritz Bauer, Altdorf, Germany, assignor to Suspa Federungstechnik Fritz Bauer & Sohne OHG, Nurnberg, Germany

Filed Apr. 13, 1976, Ser. No. 676,627
Claims priority, application Germany, Apr. 15, 1975, 2516478
Int. Cl.[2] F16F *9/02*
U.S. Cl. 267—120 **6 Claims**



1. In a gas spring comprising a housing formed from a sealed cylindrical tube having an internal chamber filled with compressed gas, and a piston rod mounted coaxially displaceably in said chamber, said piston rod supporting a guide piston and emerging in a sealed manner from an end of the housing and acting as a compression piston, the improvement wherein

said piston rod is provided with an extension projecting beyond the guide piston, said housing having a space provided in the vicinity of the end of said housing opposite the end through which the piston rod emerges, into which space the extension enters in a sealing manner when the piston rod approaches its fully retracted end position, and

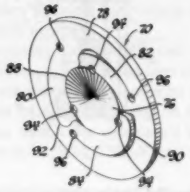
means to reduce the pressure of residual gas within said space to zero or close to zero when said piston rod is in its substantially fully retracted position, said means comprising valve means connecting said space with said chamber to open as said extension enters said space and to close when the extension begins to emerge from the space.

4,045,009

ENERGY ABSORBING UNIT WITH IMPROVED CONTROL VALVE

James M. Pees, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1975, Ser. No. 632,370
Int. Cl.[2] F16F *9/22, 9/34*
U.S. Cl. 267—139 **2 Claims**



1. An impact energy absorbing unit mounting a bumper assembly to a support on an automotive vehicle comprising: first and second cylinders, support means mounting said first cylinder for telescopic movement with respect to said second cylinder between an extended position and a retracted position, said first and second cylinders having cooperating stop means to establish the extended position of said cylinders, said first cylinder having cap means fixed at one end thereof and slidably disposed in said second cylinder to provide variable volume first and second fluid chambers in said unit, a hydraulic fluid in said first and second chambers, a centralized axial fluid passageway through said cap means hydraulically interconnecting said chambers, a one-piece valve element for controlling the flow of fluid in either direction through said passageway, said valve element comprising an outer annular part secured to said cap around said passageway, an inner disc part aligned with said passageway and a plurality of arcuate spring arms disposed in a circle around said inner disc part and attached at equally spaced peripheral point to said inner disc part for yieldably interconnecting said inner disc part to said outer annular part and for biasing said inner disc part into a blocking position relative to said passageway and further being yieldable in response to fluid pressure on said inner disc part to permit said inner disc part to move in a linear path away from said passageway to thereby control the flow of fluid between said chambers in one direction for absorption of energy from an impact load applied to said bumper assembly telescoping said cylinders, motor means to restore said cylinders to said extended position after removal of said impact load, and a plurality of fluid passage means extending through said valve element for metering fluid flow between said chambers in a direction opposite to said one direction as said motor means restores said cylinders to said extended position.

4,045,010

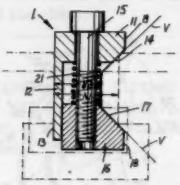
ABUTMENT PIECE ADAPTED TO BE INSERTED IN A T SLOT OF A MACHINE TOOL TABLE

Franz Arnold, Spatzenweg 20, 8960 Kempten, Germany

Filed Apr. 28, 1976, Ser. No. 681,122
Claims priority, application Germany, May 2, 1975, 7514168[U]
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 269—315 **6 Claims**

1. In an abutment piece adapted to be inserted in a T slot of a machine tool table and which bears against a lateral surface of a leg section of the T slot by means of an abutment surface and projects beyond the clamping surface of the machine tool table, the improvement comprising wherein the abutment piece has a head portion projecting beyond the clamping surface and the width of which is greater than the slot width of the leg section, the abutment piece has a neck portion engaging in the T slot and the width of which is smaller than the slot

width, the head portion has on its side facing away from the abutment surface a bearing surface inclined at 45° with respect to the abutment surface and extending toward the neck portion and by means of which the head portion is supported on the chamfered outer edge of a lateral surface of the leg section, the said outer edge adjoining the clamping surface, and on the neck portion of the abutment piece there is provided a wedge



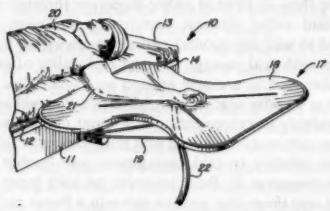
element movable parallel to the abutment surface and perpendicularly to the head portion by means of a clamping screw and engaging in the widened flange section of the T slot, the wedge surface of the said wedge element, which faces the bearing surface and is inclined at an opposite angle with respect to the abutment surface, being pressable against the inner edge of the corresponding lateral surface of the leg section.

4,045,011

ARMBOARD

John L. Ford, 4651 E. Palomino Road, Phoeniz, Ariz. 85018

Filed Oct. 27, 1976, Ser. No. 736,074
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—328 **4 Claims**



1. An armboard for detachable securement to a medical table and for supporting the arm of a patient during medical or surgical procedures, said armboard comprising:

a. a generally planar support member having an inboard edge and an outboard edge, and having an upper surface for receiving an arm thereon;

b. attachment means carried proximate the inboard edge of said support member for detachably affixing said armboard to said table; and

c. brace means carried by and depending from said support member and inclined toward said inboard edge and having a free end for abutting said table and for stabilizing said support member in a generally horizontal position.

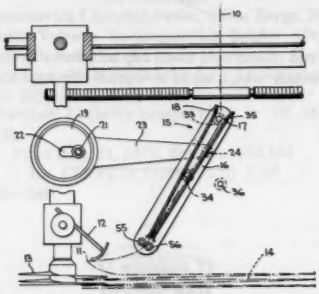
4,045,012

ADJUSTABLE FOLDING APPARATUS FOR ZIGZAG FOLDING

Hans Jakob, Darmstadt-Eberstadt, Germany, assignor to Maschinenfabrik Goebel GmbH, Darmstadt, Germany

Filed May 27, 1976, Ser. No. 690,670
Claims priority, application Germany, May 27, 1975, 2523424
Int. Cl.[2] B65H *45/20*
U.S. Cl. 270—79 **7 Claims**

1. In a folding apparatus having a frame member and including at least one oscillating channel guide device for delivering a web of paper or other material downwardly from a web conveyor in zigzag folds, said device having opposite sides, means for effecting a synchronous movement of said channel guide device including at least one rotatable cam having elongated arms connected to said opposite sides of said channel guide device at first pivot points for reciprocating same upon rotation of said cam, said cam being mounted on a drive shaft by fastening means extending through an elongated opening extending substantially along the longitudinal axis of said arms, said device having at least a first and second pair of bearing openings therein which are respectively co-axial and which extend parallel to said drive shaft, said openings being spaced from said first pivot points, and a first pair of co-axial rod



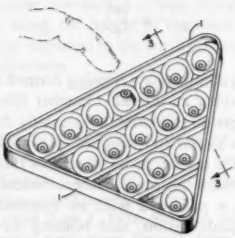
members and a second pair of co-axial rod members, each pair respectively mounted on said frame member for axial shifting movement into and out of engagement with said first and second pair of co-axial openings for establishing second pivot points in said channel guide device, means for moving each respective pair of rod members into engagement with said first and second pair of co-axial openings thereby establishing alternate second pivot points in said device, whereby the amplitude of said channel guide device may be adjusted depending on the particular engagement between said co-axial rod members and one of said co-axial openings.

4,045,013

MARKER BOARD

Theo M. S. Coster, Beyt Horon Street 7, Tel Baruch, Israel

Filed Sept. 5, 1974, Ser. No. 503,307
Claims priority, application Israel, Jan. 22, 1974, 44054
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—136 F **2 Claims**



2. A marker board comprising:

a. a frame structure defining the spatial extent of the board;

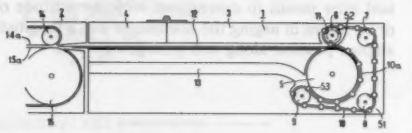
b. an array of annular base rings forming at least part of said frame structure;

c. a plurality of flexible shells;

d. peripheral base portions of said shells formed respectively integrally with said rings, said shells being independently and reversibly invertible with respect to said frame structure; and

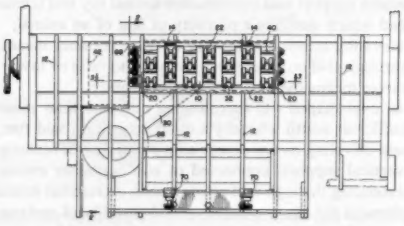
e. said frame structure further comprising at least one frame bar which is formed integrally with and between an adjacent pair of rows of said rings.

4,045,014
SHEET FILM MAGAZINE FOR AN X-RAY FILM EXCHANGER
Ronny Karlsson, Mamsellstigen, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Nov. 12, 1976, Ser. No. 741,387
Claims priority, application Germany, Nov. 13, 1975, 2551047
Int. Cl.[2] B65H *1/04, 5/02*
U.S. Cl. 271—8 R **10 Claims**



1. A sheet film magazine for an X-ray film exchanger which has means for transporting individual unexposed sheets of film received from the magazine to an exposure station, said magazine having a housing with a chamber, a drum mounted for rotation in the chamber and having a cylindrical surface, a belt having a set of teeth spaced along one surface thereof, means for mounting the belt for movement along a path in the chamber with a portion of the belt being biased toward a portion of the cylindrical surface and the spaced teeth being urged into engagement with said portion of the cylindrical surface, means disposed in said housing for guiding a leading edge of an inserted sheet of film between the belt and cylindrical surface, and drive means connected to one of said means for mounting and the drum for rotating the drum and moving the belt in said path with the surface of the drum and the belt moving together in an incremental step-like manner with each step having a distance equal to the distance between adjacent teeth on the belt, so that a portion of each sheet of film inserted into the magazine is engaged between the cylindrical surface and the belt and the leading edges of adjacent sheets are offset from each other a distance equal to the distance between adjacent teeth.

4,045,015
ROTARY FEEDER FOR PAPERBOARD BLANKS
Louis M. Sardella, Towson, Md., assignor to Wm. C. Staley Machinery Corporation, Hunt Valley, Md.
Filed Jan. 6, 1977, Ser. No. 757,158
Int. Cl.[2] B65H *3/64*
U.S. Cl. 271—112 **8 Claims**



1. Apparatus for feeding paperboard blanks one by one from a stack of blanks to nip rolls for feeding to printing, cutting, slotting, folding, gluing or the like machinery, said apparatus comprising

a. stack supporting structure;

b. feed means comprising wheels adapted to be rotated and each having

i. an active portion with an exterior convexly curved contour with a high coefficient of friction and

ii. a relieved portion;

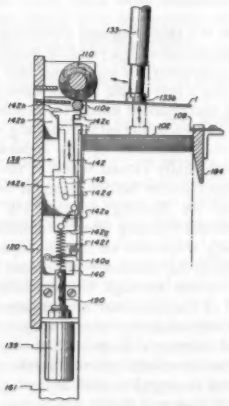
c. transmission means comprising input shaft means which is adapted to be rotated and an output shaft means which is adapted to be rotated, said input and output shaft means being operatively connected so that the output shaft means undergoes a controlled acceleration during an initial portion of each revolution of said input shaft means and is stationary during a last portion of each revolution of said input shaft means;

d. means operatively connecting said output shaft means with said wheels so that during operation of the apparatus the wheels are rotated and undergo controlled acceleration followed by a net deceleration followed by a dwell period during which the wheels are in a dwell position;

e. suction means for urging a blank into contact with the feed means;

whereby the wheels engage and grip a blank by means of static friction and move and accelerate that blank to the nip rolls without slippage occuring and so that each blank enters the nip rolls in register whereupon the blank is disengaged from the wheels.

4,045,016
APPARATUS FOR AUTOMATIC MICROPHOTOGRAPHY
Andrew L. Amort, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 526,250, Nov. 22, 1974, Pat. No. 3,947,118.
This application Mar. 25, 1975, Ser. No. 561,759
Int. Cl.[2] B65H *7/04*
U.S. Cl. 271—155 **1 Claim**



1. An apparatus for sensing the height of a stack of cards comprising:

a bar having a projecting portion thereof adapted to engage the upper surface of the uppermost card in said stack;

a first spring biasing said bar in a position so that it does not engage said stack;

a solenoid to displace the bar downward in response to an actuating signal;

means for urging said projecting portion of said bar into contact with the upper surface of the uppermost card in said stack as said bar is urged downward by said solenoid;

means responsive to the position of said bar to provide a signal when the height of the stack is below a predetermined level, said means including a microswitch actuated by said bar;

a second spring connecting said bar to said solenoid, wherein upon energization of the solenoid the microswitch is actu-

ated when said height is below said predetermined level, and

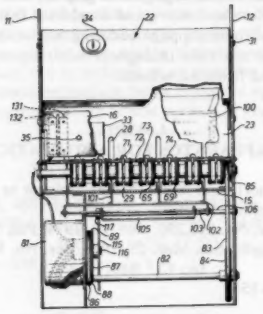
a motive source operative upon the energization of said microswitch upon the energization of said solenoid to raise the stack of cards to a position to displace the bar in an upward direction against the bias of said second spring an amount sufficient to deactuate the microswitch.

4,045,017

METHOD OF AND AN APPARATUS FOR COLLECTING VALUABLE SHEET-SHAPED OBJECTS

Leif Jörgen Ingemar Lundblad, Haradsvagen 102, Huddinge, Sweden

Filed May 1, 1975, Ser. No. 573,769
Claims priority, application Sweden, May 9, 1974, 7406187
Int. Cl.[2] B65H *29/46*
U.S. Cl. 271—181 **12 Claims**



1. Apparatus for receiving and collecting sheet-shaped objects representing a value in a vending machine, said apparatus comprising: a container for collecting said objects, said container comprising a removable and lockable cassette having an intake opening and resilient means for pushing existing objects in the container towards the intake opening, said cassette cooperating with the remainder of the apparatus such that the cassette is substantially closed when in the apparatus; means for locking said cassette before removal from the apparatus; feeding means for feeding successively received objects through said intake opening into the container; and actuating means including a number of finger-shaped means movably suspended outside the container and means for displacing said finger-shaped means through corresponding openings in at least one wall of the container into engagement with existing objects in the container for temporarily compressing and/or displacing said existing objects such that a free space is provided in the container adjacent said intake opening, said feeding means being arranged to feed at least one object into said free space, such that said object will be put together with said existing objects when the temporary compressing and/or displacing action of said actuating means stops.

4,045,018

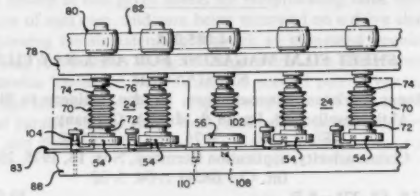
DOCUMENT DESKEWING APPARATUS

Gunnar P. Michelson, Van Nuys, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sept. 16, 1976, Ser. No. 723,687
Int. Cl.[2] B65H *9/16*
U.S. Cl. 271—251 **14 Claims**

1. Apparatus for aligning documents comprising a passageway along which documents are transported in edgewise manner,

rotatable drive means normally assuming an inclined attitude and engageable with the documents for driving thereof in a downwardly inclined direction along said passageway, and rotatable idler means operably associated with the documents and including bearing means pivotally supported off center of rotation of said idler means to permit



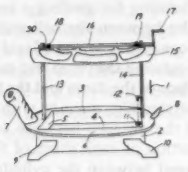
said idler means to correspond with the attitude of said drive means in urging the documents into a longitudinally aligned position along said passageway.

4,045,019

COMBINATION ANIMAL TOY AND CONTAINER

Robert J. Wade, 104 Crestline Drive, Charleston Heights, S.C. 29405

Filed Dec. 31, 1975, Ser. No. 645,822
Int. Cl.[2] A63G *31/00*
U.S. Cl. 272—1 A **4 Claims**



1. A combination animal toy and container comprising:

a. a container means operative to hold materials and shaped whereby a child may enter said container means;

b. cover means operative to cover said container means and convexly contoured to simulate the outer portion of an animal;

c. appendage means extending from said combination animal toy and container, simulating a plurality of appendages of an animal wherein said appendage means comprises a plurality of feet-simulating, load-bearing bottom supports, which support said combination animal toy and container, and which simulate a plurality of feet of an animal;

d. elevating means, connecting to said container means and through said cover means, operative to raise or lower said cover means over said container means;

e. an oval-shaped rim surrounding said container means of sufficient width whereby a child may sit on said rim; and

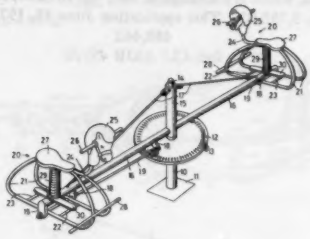
f. said elevating means comprising a plurality of rectangular, vertical supports connected to said container means and extending through said cover means; a crankbar extending through the upper portion of said plurality of rectangular, vertical supports containing a plurality of holes within said crankbar; a crank connected to said crankbar; a plurality of line secured to said cover means, each of said plurality of line extending through one of said plurality of holes within said crankbar whereby when said crank is turned, said crankbar revolves to wrap or unwrap said plurality of line around said crankbar and, therefore, raise or lower said cover means.

4,045,020

OCCUPANT-PROPELLED ROUND ABOUT

Raymond Townsend, 61 Dragon St., Warwick, Australia

Filed July 22, 1975, Ser. No. 598,154
Int. Cl.[2] A63G *1/20*
U.S. Cl. 272—33 R **2 Claims**



2. An amusement ride comprising:

a. a substantially vertical standard;

b. a hub rotatable on said standard;

c. a rotatable frame including a plurality of carrier arms fixed to and radiating from said hub;

d. a substantially horizontal actuating shaft mounted for oscillation on each arm;

e. a seating unit mounted on and fixed for oscillation with each shaft, each seating unit including a rocking horse secured above the respective actuating shaft, spring means between the rocking horse and the respective carrier arm to bias the rocking horse to an upright position, and stop means for limiting the oscillation of the rocking horse in both directions;

f. a ratchet wheel fixedly secured coaxially on said standard; and

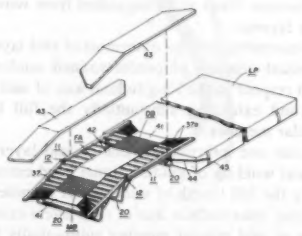
g. a detent on each shaft to coact with said wheel so that each oscillatory movement of said seating unit and of said shaft in one direction imparts rotary motion to said hub and to said arms.

4,045,021

TRAMPOLINE APPARATUS FOR USE IN CONNECTION WITH TUMBLING AND THE LIKE

George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 449,243, March 8, 1974, abandoned. This application July 16, 1975, Ser. No. 596,311
Int. Cl.[2] A63B *5/18*
U.S. Cl. 272—65 **9 Claims**



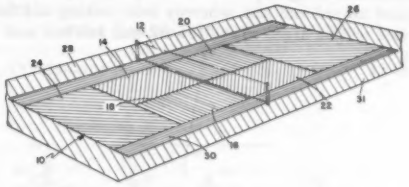
1. Trampoline apparatus for use in connection with tumbling and the like, the apparatus including elongated laterally spaced side members extending longitudinally of the apparatus and defining a trampoline-like bed frame but open at its opposite ends, a trampoline-like bed but narrower relative to its length of flexible material extending longitudinally of the apparatus disposed between the frame side members, the length of the bed being substantially 3 times or more its width to provide directional rebound characteristics, the bed having a pair of bed side edges along and spaced from the frame side members and first and second opposite bed ends unenclosed by the respective opposite ends of the frame, a plurality of elongated and resiliently extendable members interconnecting the bed side edges and the frame side members to effectively resiliently suspend the bed in tension therebetween, the resilient members most adjacent the open ends of the bed providing a greater tension on the side edges of the bed than is provided by the resilient members along the remainder of the bed side edges effective so that a performer running along a floor or the like and then jumping onto the first end of the bed is rebounded therefrom onto and then off the second end of the bed and onto the floor or the like, and means for supporting the frame and bed in overlying spaced relation above a floor or the like.

4,045,022

NO-LINE TENNIS COURT

Geoffrey F. Grant, La Jolla, and Robert W. Nicks, Del Mar, both of Calif.

Filed Apr. 23, 1975, Ser. No. 570,727
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 R **4 Claims**



1. A tennis court for playing singles or doubles tennis in which stripes between zones have been eliminated thereby eliminating two closely spaced lines on opposite edges of the stripes, said court comprising a playing surface;

a net dividing said playing surface into a fore court and a far court; said fore court comprising a pair of quadrilaterally shaped near serving zones of different colors abutted to define a boundary line therebetween, said boundary line being defined only by the zone of one near receiving court being a first color and said other near serving zone being of a different color, an end play zone of a different color than said near serve-receiving zones and defining a laterally extending boundary line by the differences in colors between said end play zone and each of said near serving zones, and an end out of bounds zone of a different color than the color of said end play zone and said colors meeting and defining a laterally extending out of bounds boundary line for said near court; said far court comprising a pair of quadrilaterally shaped far serving zones each of different colors and abutted to define a boundary line therebetween only by the differences in colors therebetween, an end play zone of a different color than either of said far serve-receiving zones and defining a laterally extending boundary by the differences in colors between said end play zone and each of said far serving zones, and an end out of bound zone of a different color than the color of said end play zone and said colors meeting and defining therebetween a laterally extending out of bounds boundary line for said far court; a pair of double zones each having a color different than said near court end zone and said far court end zone and different than its abutted serve receiving zones, said colors of said doubles zones and said end zones and abutting serve-receiving zones defining the interior boundary lines for said doubles zones; and a pair of side out of bound zones extending fore and aft along said outer edges of said double zones and being of a different color than its adjacent doubles zones and meeting and defining by said differences in colors the outer side boundaries of said doubles zone.

4,045,023
GAME APPARATUS

Russell H. Heffley, Jr., 1533 Lochinvar Drive, Fort Wayne, Ind. 46825

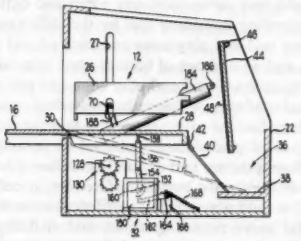
Division of Ser. No. 405,575, Oct. 11, 1973, Pat. No. 3,897,947. This application Dec. 9, 1974, Ser. No. 530,742
Int. Cl.[2] A63B 69/36
U.S. Cl. 273—35 B 8 Claims

1. A game apparatus of the driving range type comprising an elongated fairway, one end of said fairway being narrower than the other of said ends, a tee adjacent said one end, said fairway having a longitudinal axis, said fairway having a continuous and generally planar surface extending between said ends on both sides of said axis, said fairway surfaces sloping downwardly from said one end to said other end, said fairway surfaces also being sloped downwardly from the lateral edges thereof toward said axis, whereby balls striking said fairway surface will e urged to roll toward said axis and said other end.

4,045,024
BOWLING ALLEY GAME

Jeffrey D. Breslow, Highland Park; Eugene Jaworski, Park Ridge, and Tom Kenzo Sakoda, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed June 21, 1976, Ser. No. 698,177
Int. Cl.[2] A63D 5/08
U.S. Cl. 273—43 A 17 Claims

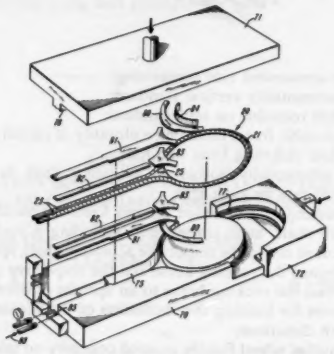


1. A bowling alley game including an automatic pin clearing apparatus, comprising:
a bowling alley having a pit at one end thereof;
a pin supporting, tiltable alley portion at the end of said alley adjacent said pit, said tiltable alley portion being pivotally connected to the end of said alley for movement between a generally horizontal position, coplanar with the alley, and a pin clearing position whereat the tiltable alley portion is pivoted downwardly with respect to said alley causing pins thereon to be transferred to the pit;
drive means for moving the tiltable alley portion between its respective positions; and
a manual actuator connected to said drive means for initiating operation thereof.

4,045,025
GLASS FIBER TENNIS RACKET FRAME

Anthony F. Staub; Norman T. Staub, both of Dayton, Ohio, and John R. Erwin, Paradise Valley, Ariz., assignors to Starwin Industries, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 332,130, Feb. 13, 1973, abandoned, which is a division of Ser. No. 107,304, Jan. 18, 1971, Pat. No. 3,755,037. This application June 18, 1974, Ser. No. 480,462
Int. Cl.[2] A63B 49/10
U.S. Cl. 273—73 F 7 Claims

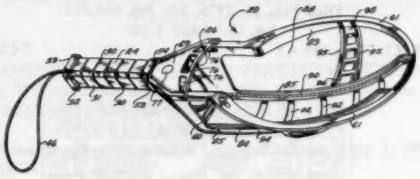


1. A racket frame of the character described comprising:
a. an elongated hollow tubular member having the central portion thereof curved to define the generally oval head portion of said frame and having the end portions thereof extending in close parallel relation from said head portion to define the handle portion of said frame,
b. the wall of said tubular member consisting essentially of a plurality of contiguous concentric annular layers of high tensile strength fibers impregnated and bonded together in tension by binder resin,
c. each of said layers consisting of unidirectional essentially continuous fibers as distinguished from woven or braided fiber layers,
d. the innermost and the outermost of said layers each being a helical winding of predetermined unidirectional hand with respect to the longitudinal axis of said tubular member and extending substantially the full length of said tubular member,
e. at least one intermediate one of said layers also being a helical winding of unidirectional hand extending substantially the full length of said tubular member,
f. another intermediate one of said layers extending lengthwise of said tubular member substantially the full length thereof,
g. at least one additional intermediate one of said layers being a helical winding of unidirectional hand extending along only said head-defining portion of said tubular member,
h. adjacent said helically wound layers being of opposite unidirectional hands, and
i. means cooperating with said end portions of said tubular member to form the handle of said frame.

4,045,026
JAI ALAI APPARATUS

Richard Lee Gillespie, and Arthur Kelso Melin, both of San Gabriel, Calif., assignors to Wham-O Mfg. Co., San Gabriel, Calif.

Filed Oct. 14, 1975, Ser. No. 622,238
Int. Cl.[2] A63B 65/12
U.S. Cl. 273—96 R **14 Claims**



10. A projectile throwing, catching and cradling game apparatus comprising:

a. a projectile having a texturized surface and

b. a hand-held implement including:

1. handle means;

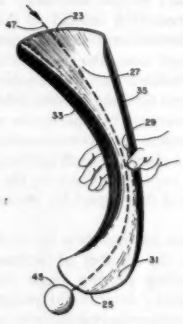
2. a cradling section for the projectile connected to the handle means; and

3. a throwing and catching receptacle for the projectile connected to the cradling section, said receptacle comprising a closed loop elongated frame having a pair of tracks located interiorly of the receptacle, the surface of the tracks having a texture to cooperatively engage the surface texture of the projectile, said tracks extending longitudinally of the frame to guide the path and to maximize the spin of the projectile between the cradling section and the end of the frame opposite the cradling section thereby maximizing the curvature of the projectile's trajectory.

4,045,027
DEVICE FOR INTERCEPTING AND DEFLECTING A MOVING BODY

Wayne E. Manska, Santa Ana, Calif., assignor to Ronald R. Moody, Yorba Linda, Calif.

Filed Dec. 15, 1975, Ser. No. 640,644
Int. Cl.[2] A63B 65/12
U.S. Cl. 273—96 R **12 Claims**



1. A device for intercepting and deflecting a body in motion, comprising:

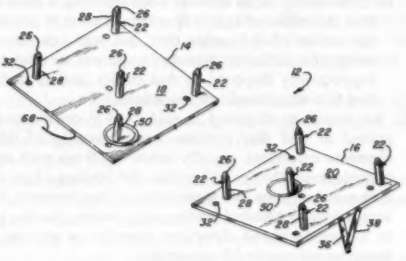
an elongated member having two ends and a surface therebetween over which a body may be directed, said surface containing a center line of symmetry along the length thereof and being progressively curved along said center line from a radius of curvature adjacent said one end to a larger radius of curvature adjacent said other end such that the curvature of said elongated member adjacent said other end substantially approximates the path of a body in motion which may be intercepted by said other end and progressively increases from said other end to said one end to smoothly deflect and change the direction of the intercepted body from the original path; and

a pair of rail members attached to said surface of said elongated member, said pair of rail members being substantially parallel adjacent said one end and spaced apart by a distance greater than the diameter of the body which may traverse therebetween, said rail members progressively flaring outwardly from said one end to said other end to form therebetween a substantially wide flat area adjacent said other end such that a body which may be intercepted by said substantially wide flat area is deflected smoothly along said surface between said pair of rail members with a minimum number of contacts with said pair of rail members as the body traverses the length of said surface of said elongated member.

4,045,028
GAME TARGET WITH ADJUSTABLE PINS

Lonnie V. Dyess, 2644 Chestnut Drive, Grand Junction, Colo. 81501

Filed Aug. 23, 1976, Ser. No. 716,715
Int. Cl.[2] A63B 21/04
U.S. Cl. 273—104 **12 Claims**



4. A game target comprising

a. a pair of members each having a generally planar playing surface,

b. a plurality of pin means associated with each playing surface,

i. each pin means including a first member having a longitudinal axis disposed generally perpendicular to said playing surface, each first member of said pin means having a free end disposed outwardly from said playing surface, each pin means being spaced apart one from the other,

ii. each of said pin means including a second member having a part thereof mounted for movement toward and away from the free end of the first member of said pin means, said second member having a longitudinal axis, said part of said second member being disposed, in one position of said second member, more distally from the playing surface than the free end of the first member of said pin means with a longitudinal axis of said second member being generally colinear with the longitudinal axis of said first member,

c. means formed on each of said playing surfaces for cooperating with the free ends of the first member of the pin means of the other playing surface for positioning said playing surfaces relative to each other in a predetermined manner when said playing surfaces are disposed in opposed, generally parallel relationship one to the other, and

d. means for securing together said members for compact storage and transportation of said game.

4,045,029

AERODYNAMIC ORIFICED DISC

Peter C. Katzmark, 3668 Tilden, Los Angeles, Calif. 90034

Filed Dec. 31, 1975, Ser. No. 645,713
Int. Cl.[2] A63H *27/00*
U.S. Cl. 273—106 B **1 Claim**

1. A toy centrally orificed circular disc having such aerodynamic capability as to enable said disc to sustain itself in stable flight when projected with a spin in a plane substantially parallel to the ground, said disc comprising:

A. a convexly raised outer annular portion, the periphery of said outer annular portion being at a lower level than the apex of the convex of said outer portion; and

B. an inner annular portion, said inner annular portion being

i. integral with said convexly raised outer annular portion;

ii. sloping inwardly toward the axis of the disc; and

iii. terminating in an annular edge defining a central orifice, the radius of said orifice being less than one-half of the radius of the entire disc, but said central orifice being of a sufficient diameter to permit an object to be supportively disposed in said orifice and spaced from said last-mentioned annular edge;

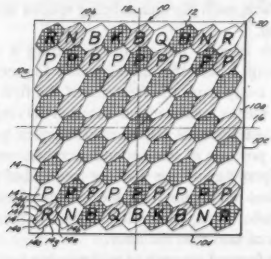
C. An object so disposed in said central orifice and supported in said disc position by a plurality of dihedral elements extending spirally inwardly from said annular edge defining the central orifice, the leading edges of said elements being on the same sides of the elements to present extended dihedral leading edges when the disc is spun in a predetermined direction, thereby to provide additional aerodynamic lift capability.

4,045,030

CHESS GAME APPARATUS

Casimir S. Strozewski, 2526 N. Santiago, Santa Ana, Calif. 92706

Filed Mar. 31, 1976, Ser. No. 672,161
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—131 AB **8 Claims**



1. A game comprising in combination,

a game board having a playing surface,

a playing configuration formed on said surface comprising contiguously arranged hexagonal spaces each side of which is aligned with the corresponding side of other spaces along axes at 90° or 45° to each other, and two sets of playing pieces, each set of which comprises a king, a queen, three bishops, two knights, two rooks, and nine pawns, all of the pieces in each set having indicia of only the respective set of pieces.

4,045,031

BOARD GAME APPARATUS

William Brenton Arnold, 21 W. Ivy Lane, Englewood, N.J. 07631

Filed Feb. 24, 1976, Ser. No. 660,817
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 AT **7 Claims**

1. Board game apparatus for playing a board game among a plurality of players, said board game apparatus comprising:

a playing board having a playing surface;

a central area on the playing surface, the central area displaying a representation of a court system including lower and higher courts arranged in a prescribed inner sequence of play proceeding from each lower court to a higher court in the court system;

movable playing pieces for representing the players on the playing surface;

a plurality of outer areas arranged sequentially on the playing surface around the central area and defining an outer path of travel of fixed increments for the playing pieces, some of the outer areas including representations of different fictional claims enforceable by a corresponding lawsuit and others of the outer areas including representations of imaginary people arbitrarily designated as experts in fields of endeavor related to the subject matter of the fictional lawsuit-enforceable claims, the representations being spaced along the outer path of travel;

first game elements each corresponding to a representation of a different fictional lawsuit-enforceable claim for denoting the possession by a particular player of a claim capable of enforcement by a corresponding lawsuit;

second game elements each corresponding to a representation of an expert for denoting the possession by a particular player of that expert for use as a witness in the related lawsuit;

chance means for operation by each player, in sequence, to determine the number of increments of movement of a corresponding playing piece along the outer path of travel, thereby determining possession among the players of the lawsuit-enforceable claims and the experts for use as witnesses, and establishing the parties to a lawsuit through chance location of a playing piece upon an outer area, and for operation by a party to a lawsuit to determine, by chance, the outcome of the lawsuit, once the lawsuit-enforceable claim is asserted in the court system, in accordance with the procedure prescribed by the inner sequence of play through the court system;

the central area including a specific location for the second game element corresponding to the expert in the field related to the subject matter of the lawsuit in the court

system, whereby placement of the appropriate second game element by a party at the specific location engages the expert as a witness for that party to increase the chances of that party prevailing in the outcome of the lawsuit; and

game pieces for representing assets of each player, the assets as represented by the game pieces to be transferred between players in accordance with the outcome of the lawsuits to which the players are parties.

4,045,032

GAMES PRACTICE NET AND PROTECTVE SCREEN

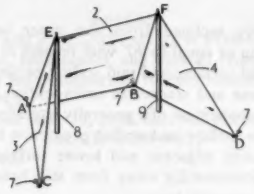
John William Andrew Cox, Arbroath, Scotland, assignor to Macleisure Limited, Scotland

Filed Apr. 29, 1975, Ser. No. 572,851

Claims priority, application United Kingdom, May 1, 1974, 19083/74

Int. Cl.[2] A63B *69/36;* E04B *1/347*

U.S. Cl. 273—181 F 4 Claims



1. A games practice net and protective screen incorporating a sheet of flexible material capable of being laid flat, the shape of the sheet when laid flat being that of a hexagon comprising a quadrilateral center portion and two triangular wing portions, all of the angles of said triangular wing portions being acute angles and said triangular wing portions being so orientated that the bases of the triangular wing portions are common with respective opposite parallel sides of the quadrilateral center portion so that the sheet has six sides and six salient corners, a ring located at each of the six corners, and a pair of cords connected to and linking the rings which are located at the corners defined by the ends of the bases of the triangular wing portions.

4,045,033

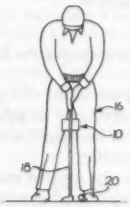
GOLF PUTTING AID

Cary Schuman, 3276 Longridge Terrace, Sherman Oaks, Calif. 91423

Filed Mar. 22, 1976, Ser. No. 669,242

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—188 R 3 Claims



1. A golf putting aid configured to be placed between the golfer's legs comprising an elongated rigid member having a first pair of opposed concave indentations of equal curvature in the side surfaces of said member for receiving said legs to maintain said legs spaced apart in a substantially fixed putting position, and a second pair of opposed, concave leg receiving indentations of equal curvature positioned in the ends of said member and spaced a different distance apart than said first pair of concave indentations to provide the golfer a second leg spacing position upon the spatial rotation of said member.

4,045,034

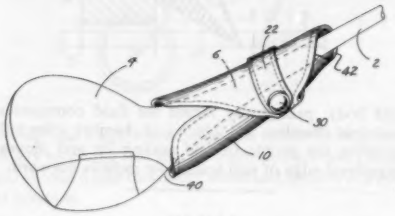
GOLF CLUB WEIGHTED ATTACHMENT

Lewis P. Thomas, Box 4116 Long Beach Branch, Long Beach, Calif. 90804

Filed June 16, 1975, Ser. No. 587,338

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—194 B 10 Claims



1. The combination of a golf club and a weighted attachment adapted to be detachably secured thereto, the golf club including a shaft and a club head secured on one end of the shaft, the club head having an upwardly projecting hosel for receiving the shaft, the attachment including:

a. a flexible sheet shaped to be wrapped about the golf club hosel, the lower edge of the sheet defining a relatively short foot section, the edge of the foot section being shaped to fit about the heel portion of the club head, the sheet also having,

b. a first longitudinal side edge shaped to fit along the shaft,

c. a top portion, the edge along this portion being of sufficient length to wrap about the shaft,

d. a weighted mass

e. means attaching the weighted mass to the flexible sheet,

f. a second longitudinal side edge of the sheet being configured to overlie the heel portion of the hosel, and

g. securing the weighted sheet about the golf club,

h. the foot section, longitudinal side edges and the top portion of the sheet defining the four sides of the sheet,

i. the portion of the flexible sheet overlying the heel portion of the club causing the foot section of the sheet to remain above the plane of the bottom of the club.

4,045,035

INFLATABLE LIP SEAL FOR PIPES

Michel G. Lecordier, Marseille, France, assignor to Compagnie Francaise des Petroles, Paris Cedex; Etudes Petrolieres Marines, Paris; Steliers et Chantiers de Bretagne, Nantes; Compagnie Maritime D'Expertises, Marseille; Compagnie Generale Pour Les Developpments Operationnels, Paris and Entreprise de Recherches et d'Activites Petrrolieres, Paris Cedex, all of France

Filed June 15, 1976, Ser. No. 696,442

Claims priority, application France, June 20, 1975, 75.19367

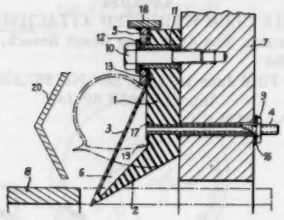
Int. Cl.[2] F16J *15/46*

U.S. Cl. 277—34.3 13 Claims

1. A lip-seal for sealing the junction between a pipe or the like projecting through an opening of larger diameter than the pipe within a flange or the like, said lip-seal comprising:

a flange with an opening; an annular body mounted to said flange and coaxial of said flange opening; a flexible sealing lip carried by said annular body and projecting radially inwardly of said annular body inner periphery at an angle to the plane normal to the seal axis; means interposed between said annular body and said lip, defining an inflatable chamber, said means for defining said inflatable chamber comprising a diaphragm more flexible than the sealing lip, fixed at one edge to the inner peripheral edge

of said lip and at an angle lesser than the lip angle, and at the other edge to said annular body, said inflatable chamber being defined between said diaphragm, said lip and



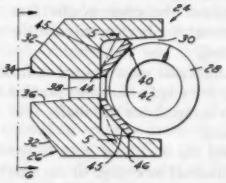
said body; passageway means for fluid communication with said chamber; and which said chamber when inflated modifies the profile of said sealing lip and moves the peripheral edge of said sealing lip radially outward.

4,045,036

PISTON OIL CONTROL RING

Rudolph C. Shunta, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Filed Oct. 18, 1976, Ser. No. 733,132
Int. Cl.[2] F16J *9/06*
U.S. Cl. 277—138 **9 Claims**



1. A composite oil control ring adapted for use as a seal between the piston and cylinder wall of a reciprocating piston internal combustion engine wherein the piston is provided with a ring groove, comprising a parted sealing ring adapted to be disposed in said piston ring groove for sealing engagement with said cylinder wall, an annular expander-spring disposed in a radially inwardly facing channel in said ring and adapted to circumferentially expand said ring into sealing engagement with said cylinder wall, and a parted annular insert disposed between said sealing ring and said expander-spring, said insert being generally V-shaped in radial cross section having inwardly diverging sides and a radially directed apex adjacent the root of said channel, said spring engaging each side of said V-shaped insert, the expanding force of said spring being transmitted through said insert to said ring.

4,045,037

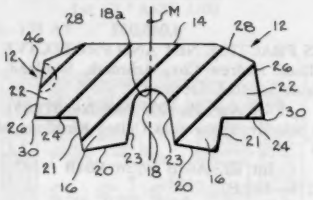
PACKING

Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 444,331, Feb. 21, 1974, Pat. No. 3,915,463. This application Oct. 17, 1975, Ser. No. 623,353
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—205 **17 Claims**

1. An elongate strip packing member comprising:

first and second lip sections adjoined to form a relatively broad planar head surface, each of said lip sections including a base having an outer lateral surface; said packing member having a groove between said bases extending the length of said packing member and opening downwardly away from said head surface; said first lip section further including a laterally outwardly depending sealing projection, said sealing projection having a generally laterally outwardly facing side surface and a lower surface, said lower surface being adjoined to the outer lateral surface of said base of said first lip section and, in a relaxed state, being generally inclined from its laterally inner to its laterally outer extremities at an angle so as to be non-



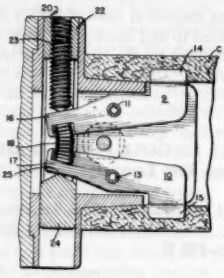
downwardly inclined from the outer lateral surface greater than or equal to 90° with respect to a line normal to said head surface, and said sealing projection being of such volume and transverse cross-section configuration that upon application of a generally laterally inward force to said side surface said sealing projection is deformed to form a cavity adjacent said lower surface, said cavity opening downwardly away from said head surface and forming a pressure trap.

4,045,038

HOLLOW CORE CHUCKING DEVICE

David Noel Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 31, 1976, Ser. No. 719,158
Int. Cl.[2] B23B *31/40;* **B65H** *75/24*
U.S. Cl. 279—2 R **2 Claims**



1. A chucking device for engaging the hollow core of a web of material comprising:

a. a tapered chuck plug consisting of a generally cylindrical and tapered body portion and an enlarged base portion;

b. means for attaching the base portion of said tapered chuck plug to a rotatable spindle;

c. an opening formed in the tapered end of said chuck plug comprising an elongated slot that extends internally of the chuck plug from its back portion to the extreme tapered end thereof where the slot opens into the surface face of said chuck plug;

d. a pair of oppositely disposed core engaging elements pivotally mounted in said opening, said core engaging elements comprising a pair of chuck dogs which are pivotally mounted in said elongated slot at opposed sides of said chuck plug for movement from a normal retracted position within said chuck plug to a core engaging position

exteriorly of said chuck plug, said chuck dogs being generally aligned with one another and consisting of angular elements that are sharpened at their core engaging ends and which have means at their opposite ends for accepting and retaining a compression spring device that normally biases the chuck dogs into their retracted position within the chuck plug slot; and,

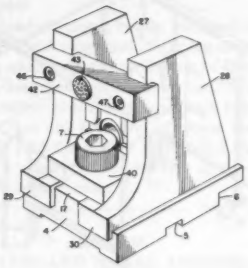
e. means located in said chuck plug for urging said chuck dogs into contact with the inside of a core placed on said chuck plug, said means comprising a slide element having an elongated cylindrical body with a slotted central portion for accomodating the opposite ends of said chuck dogs and said compression spring device located in said chuck plug base, said slide element further comprising a threaded upper portion which accomodates a set screw element and a solid lower portion having a raised base section wherein mechanical actuation of said set screw serves to overcome the compression spring bias to urge the sharpened ends of said chuck dogs into their core engaging position.

4,045,039

ADJUSTABLE CLAMPING JAW FOR CHUCKS

James W. Pope, Indianapolis, and Max E. Overpeck, Mooresville, both of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Sept. 13, 1976, Ser. No. 715,964
Int. Cl.[2] B23B *31/12*
U.S. Cl. 279—123 **16 Claims**



1. An incrementally adjustable jaw assembly for machine tool chucks, comprising in combination;

a. a jaw base attached to a master jaw of a chuck and a top jaw mounted for incremental relative movement with respect to said jaw base,

b. tumble block and key means for providing an incrementally adjustable abutment between said top jaw and said jaw base which determines the relative position between said top jaw and said jaw base,

c. said tumble block including a multi-faceted block having differently positioned keyways in its faces, said key means being engageable with a selected of one said keyways for adjustably positioning said incremental adjustable abutment of said tumble block relative to said jaw base, and means for securing said top jaw to said tumble block and for clamping said top jaw and said jaw base together.

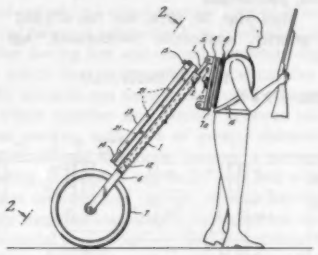
4,045,040

DEER STAND AND GAME CARRIER

Hershell W. Fails, 134 Scout Road, Freeport, Tex. 77541

Filed Jan. 13, 1976, Ser. No. 648,826
Int. Cl.[2] B62D *51/04*
U.S. Cl. 280—1.5 **3 Claims**

1. In a collapsible deer stand, a telescoping framework comprised of a first telescoping frame and a second telescoping frame, said second frame forming a ladder, means for selectively and detachably anchoring the second frame on said first frame in a collapsed position, wheels on one end of said first frame and a seat assembly pivotally mounted on the other end of said first frame, shoulder straps attached to said seat assembly, said straps and said seat assembly comprising a backpack



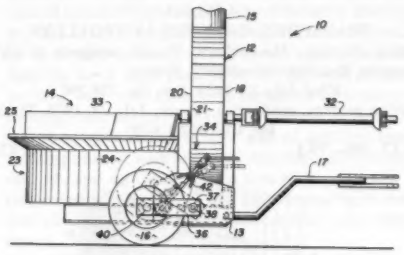
for towing said stand when collapsed, means on said seat for selectively receiving said second frame and pivotally suspending said second frame therefrom when said stand is in a noncollapsed position.

4,045,041

WHEEL ADJUSTMENT MECHANISM FOR A FORAGE BLOWER

Roger L. Risser, Leola, and Joe E. Shriver, East Earl, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed May 14, 1976, Ser. No. 686,615
Int. Cl.[2] B62D *21/18*
U.S. Cl. 280—43.17 **13 Claims**



1. In an agricultural machine having a frame and at least one ground engaging element movably mounted on said frame to support said frame at a plurality of vertical positions relative to the ground, an improved mechanism for adjusting said frame to any of said vertical positions comprising:

a. an arcuate shaped first member mounted on said frame;

b. means interconnecting said first member to said ground engaging element and actuatable to cause relative movement between said ground engaging element and said frame;

c. said interconnecting means is pivotally mounted at one end to said ground engaging element and extends through an opening defined in said first member;

d. said interconnecting means including a second member shaped to be received by said first member in a mating relationship therewith such that the forces exerted on said interconnecting means by the weight of said agricultural machine is distributed over a large area.

4,045,042

TRAVELING UNDERCARRIAGE FOR A CONTAINER OR THE LIKE

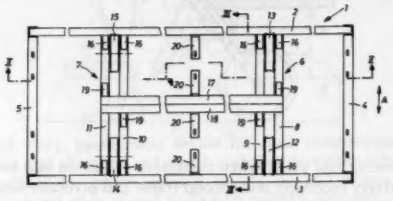
Josef Walter, Balterswil, Switzerland, assignor to J. Walter AG, Balterswil, Switzerland

Filed Mar. 30, 1976, Ser. No. 671,862

Claims priority, application Switzerland, Apr. 4, 1975, 4312/75

Int. Cl.[2] B62B *5/00*

U.S. Cl. 280—79.1 R **17 Claims**



1. A traveling undercarriage for a container, comprising a substantially rectangular frame, said frame including two main supports which extend substantially parallel to one another and transversely with respect to the direction of movement of the undercarriage, means for interconnecting the main supports with one another at their ends, transverse supports extending between said main supports, rollers carried by the transverse supports, connection elements for detachably connecting the transverse supports carrying the rollers with the main supports, and attachment elements which can be suspended at the main supports at which there are connectable transverse walls of the container, and wherein each main support comprises a hollow profile member which is open at a side confronting the other main support and each connection element comprises a first section engaging into the interior of one of the main supports and a second section threadably connected with one of said transverse supports.

4,045,043

TRANSPORT AND DISPLAY TROLLEYS

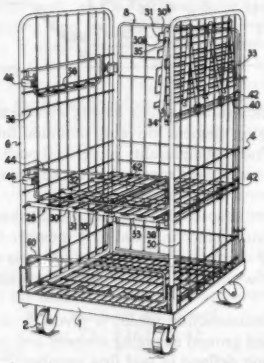
Francois Fourrey, Montbeliard, France, assignor to Cycles-Peugeot, Beaulieu-Valentigney, France

Filed July 23, 1976, Ser. No. 708,250

Claims priority, application France, July 24, 1975, 75.23136

Int. Cl.[2] B62B *3/00*

U.S. Cl. 280—79.3 **11 Claims**



1. A transport and display trolley comprising a lower platform, rollers mounted on the lower platform for shifting the trolley, two fixed grills and a movable grill, the three grills being vertically disposed and defining a space for receiving objects to be transported and being carried by the lower platform, at least one foldable shelf pivotably mounted on one of the fixed grills, the other fixed grill being opposed to said one fixed grill and having a transverse support means for said foldable shelf, said foldable shelf being pivotable between a folded back position in which it is folded against said one fixed grill and a horizontal position parallel to the platform, in which horizontal position said foldable shelf is supported on said support means; an openable gate movable from a closed position and an open position inwardly of said space defined by the grills and capable of interconnecting said two fixed grills in said closed position and disposed above said foldable shelf and slightly set back relative to an outer edge of said foldable shelf in said closed position whereby it precludes the pivoting of said foldable shelf to said folded back position and the unloading of said foldable shelf so long as the gate is in said closed position; and a fixed gate disposed above the lower platform connecting said two fixed grills together.

4,045,044

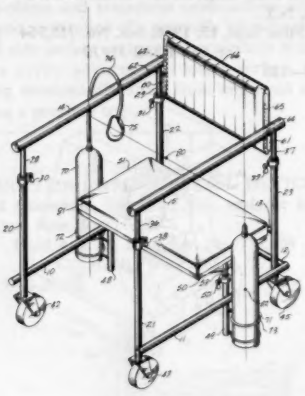
PATIENT TRANSPORT WITH OXYGEN SUPPLY

William F. Bierer, 769 Glenmont, Los Angeles, Calif. 90024

Filed Aug. 28, 1975, Ser. No. 608,525

Int. Cl.[2] B60D *7/08*

U.S. Cl. 280—87.02 R **11 Claims**



1. A patient transport comprising:

a tubular frame including two oppositely disposed sides;

a plurality of wheels attached to the frame to permit movement thereof;

first and second means for holding a pair of oxygen bottles on the respective two oppositely disposed sides of the frame outboard of the sides of the frame; and

horizontally extending patient support means attached to the frame between the first and second holding means, the first and second holding means lying below the horizontally extending patient support means.

4,045,045

FOLDABLE CHILD WALKER

Raymond W. Boucher, Dotham, Ala., and William H. Ziegler, Jr., Bedford, Pa., assignors to Hedstrom Co., Bedford, Pa.

Filed Apr. 1, 1976, Ser. No. 672,655

Int. Cl.[2] B62D *7/10*

U.S. Cl. 280—87.02 W **5 Claims**

1. A child walker comprising

A. an annular base,

B. a plurality of wheels mounted at space locations on said base,

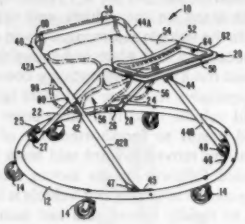
C. a supporting frame including

1. first and second interfitting frame members, each said member including a pair of legs,

2. means for pivotally connecting each leg of said first member to an adjacent leg of said second member intermediate the ends of the legs,
3. means for pivotally mounting corresponding ends of said first and second frame members to spaced positions on said base, and
4. the legs of at least one of said frame members being composed of telescoping first and second sections,

D. a seat supported between the opposite ends of the legs of said first and second frame members,

E. means for maintaining said first and second frame members upright above said base, said maintaining means including



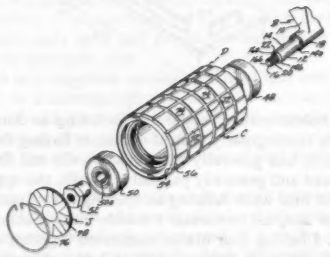
1. means for defining at least two spaced apertures extending through the wall of one of said upper and lower leg sections, and
2. a spring loaded release button mounted in the wall of the other of said upper and lower leg sections and positioned to selectively engage in one of said apertures so that the frame members are maintainable at at least two different levels above said base, said button being retractable from one aperture to release the maintaining means and fold the walker so that the frame members fold into a relatively flat position in more or less the same plane as said base.

4,045,046

SKATEBOARD WHEEL ASSEMBLY

Gary Burton Taylor, 565 W. 39th St., and Roland C. Eberhardt, 564 W. 39th St., both of San Pedro, Calif. 90731

Filed Mar. 22, 1976, Ser. No. 668,717
Int. Cl.[2] B62B 7/00
U.S. Cl. 280—87.04 A **5 Claims**



1. In combination with a skateboard having a pair of longitudinally spaced trucks, each of said trucks including a center body that has two transversely aligned stub axles projecting outwardly from opposite sides thereof, each of said stub axles including first and second axially aligned cylindrical portions, said second axle portion of smaller diameter than said first axle portion and having threads on the exterior surface thereof, said first portion forming a first body shoulder with said body and a second body shoulder at the junction with said second portion, wherein the improvement comprises four wheel assemblies rotatably supported on said stub axles, each of said wheel assemblies including:

a. a rigid cylindrical wheel member formed from a metallic material having a substantial heat conducting quality, said member having first and second oppositely disposed ends from which first and second circular cavities extend inwardly towards one another, a centrally disposed bore in said wheel member that extends between said first and second cavities, said bore of greater diameter than the diameter of said first axle portion, a circumferentially extending rib projects outwardly from said wheel member adjacent said first end thereof, said rib having a first inwardly disposed ring-shaped face that has an outer circumferential section and an inner circumferential section, said outer circumferential section substantially parallel to said first end of said member, and said inner circumferential section angularly disposed relative to said outer circumferential section, a cylindrical shell of substantially the same external diameter as said wheel member projects from said second end of the latter and is axially aligned with said wheel member and formed integral therewith, said shell having an interior cylindrical surface and exterior cylindrical surface said exterior cylindrical surface of said shell on an outwardly disposed end portion thereof having a circumferential groove formed therein;

b. first and second ball bearing assemblies disposed in said first and second cavities, each of said ball bearing assemblies including inner and outer races, said inner races having said first portion of said stub axle extending therethrough, said inner race of said first ball bearing assembly in abutting contact with said first shoulder of said body;

c. a nut in engagement with said threads on said second axle portion, said nut in abutting contact with said inner race of said second ball bearing assembly;

d. an elongate cylindrical tire formed from an elastomeric material, said tire having concentric inner and outer cylindrical surfaces and first and second end surfaces, first and second circular recesses that extend inwardly towards one another from inner portions of said first and second end surfaces, said first and second recesses each partially defined by inner walls parallel to said first and second end surfaces, said inner cylindrical surface of such diameter as to snugly and slidably engage said exterior surfaces of said wheel member and shell, said wall of said first recess in abutting contact with said outer circumferential section of said rib, and said wall of said first recess and said inner circumferential section of said rib cooperating to define a first circumferentially extending confined space therebetween;

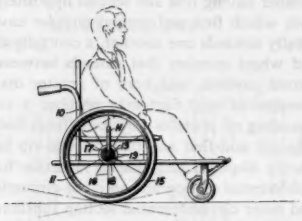
e. a retaining ring removably mounted on said outwardly disposed end portion of said shell inwardly from said groove, said retaining ring having an inwardly disposed surface defined by a first outer ring-shaped section and a second inwardly disposed ring-shaped section that is angularly disposed relative to said first ring-shaped section of said retaining ring, said first ring-shaped section of said retaining ring in abutting contact with said wall of said second recess, and said second ring-shaped section of said retaining ring cooperating with said wall of said second recess to define a second circumferentially extending confined space; and

f. resilient means that engage said groove to hold said retaining ring in abutting contact with said wall of said second recess to maintain said tire in a fixed position on said wheel member and shell, and said tire when subjected to an axially directed force as said skateboard is directed through a curved path temporarily deforming into either said first or second confined spaces, rather than cold flowing outwardly over said rib or retaining ring.

4,045,047
ONE-WAY BRAKE FOR WHEEL CHAIRS

Clair S. Buckley, Main St., Emlenton, Pa. 16373

Filed Sept. 30, 1975, Ser. No. 618,036
Int. Cl.[2] B62M *1/14*
U.S. Cl. 280—242 WC 1 Claim



1. In combination, a wheel chair having a frame, and two main wheels, each with a hub and a friction drive supported on axles and adapted to allow the chair to move forward but not backward,

said axles being fixed to said frame and,

said friction drive having an inner member and an outer member,

said inner member of said friction drive being fixed to said axle and,

the said outer member of said friction drive being fixed to said hub,

cam means on said inner member,

roller means between said outer member and said cam means,

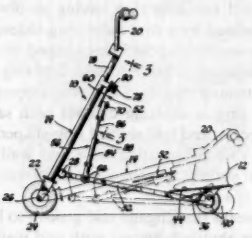
said roller means being adapted to be moved into clamping contact between said cam means and said outer clutch member when the chair is moved in a rearward direction, but to allow the chair to move freely forward whereby said chair can be moved freely forward up an incline but will not run backwards,

stop members, handle means supported on said axle connected to said stop members for rotating said stop members whereby said roller means is held away from said cam means in unactuated position and said chair may be moved freely in both a forward and a rearward direction.

4,045,048
TRAILING ARM CAMBERING VEHICLE WITH STABILIZER LINKAGE HAVING LOCKING MEANS FOR PARKING AND STOWAGE

Clarence C. Irwin, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,587
Int. Cl.[2] B62K *15/00*; B60G *19/10*
U.S. Cl. 280—278 3 Claims

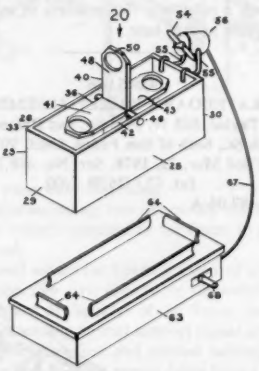


1. A cambering vehicle comprising a main frame, right and left trailing arms extending rearwardly from said main frame, forward pivot connection means pivotally connecting one end of each of said arms to said main frame so that said trailing arms may swing in an up and down movement with respect to said forward pivot connection means, a support and locking plate, pivot means pivotally mounting said support and locking plate to said forward portion of said frame in spaced relation to said forward pivot connection means for said trailing arms, left and right link means connected to said crank by laterally spaced pivot means, each of said link means extending from said plate to a pivot connection with the associated trailing arm rearward of said forward pivot connection means, front contact means steerably mounted to said main frame, manual steering means connected to said front contact means, and rear contact means for each of said trailing arms mounted at the rearward portions thereof foot rest means on each of said trailing arms rearward of said pivot connections with said link means to receive the feet of a vehicle operator so that an operator can stand on the vehicle and naturally camber the vehicle while the vehicle is moving, curved track means operatively connected to said plate and movable therewith, a follower for said track means operatively connected to said main frame and operative to secure said plate in a fixed position to stabilize said vehicle rigid in a three point stance for vehicle parking and means to foreshorten one of said links as said trailing arms are moved toward said main frame as said plate turns and said follower means moves relative to said track means to a position in which said vehicle is in a folded position, and means to rigidly secure said last mentioned link in said foreshortened position to maintain said vehicle in a collapsed position for stowage.

4,045,049
BUBBLE-MAKING APPARATUS AND MEANS FOR ATTACHMENT TO A BICYCLE

Arthur Harry Schultz, 6003 Louis Drive, North Olmsted, Ohio 44070

Filed May 9, 1975, Ser. No. 576,003
Int. Cl.[2] A63H *33/28*
U.S. Cl. 280—289 R 8 Claims



1. A bubble-making apparatus including in combination a generally rectangularly shaped container having first and second spaced and generally parallel sidewalls and first and second spaced and generally parallel endwalls, the upper perimeter of said four walls defining an opening to said container, said container adapted to contain a bubble-making solution, a paddle wheel having four blades connected together at a central location and with adjacent blades being spaced from each other about ninety degrees, pivot means connected to said paddle wheel at said central location and extending to said first and second sidewalls to rotatably mount said paddle wheel whereby said blades move in a circumferential path into and out of said container, said path being in a plane generally to said sidewalls, each of said blades having a flat surface arranged so as to have its width extend generally transverse to the plane of said path, wall means defining an opening in the

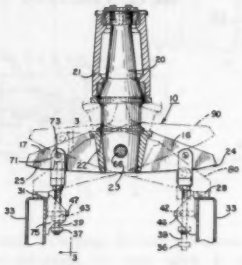
outward end portions of said blades, each said flat surface having a width upwardly of said end portion on the order of the same magnitude as the diameter of the associated said opening, and relative air flow producing means for exerting an air force against said flat surfaces of said blades in a direction transverse to said flat surfaces and, also, transverse to said pivot means to cause rotation of said paddle wheel and cause formation of bubbles at said openings when bubble-making solution is appropriately present thereat, said relative air flow producing means being the only means for rotatably moving said paddle wheel.

4,045,050

ARTICULATED VEHICLE TILT LIMITING APPARATUS

Dale Wyatt Hawk, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 10, 1976, Ser. No. 749,318
Int. Cl.² B60D *7/02*
U.S. Cl. 280—492 **5 Claims**



1. Apparatus for use in limiting relative tilt between a tractor unit and a trailer unit of an articulated vehicle comprising

pivot means operatively connected to a tractor unit and a trailer unit of an articulated vehicle for enabling said units to tilt relative to each other about a horizontal axis,

a stop engaging member carried by said pivot means and extending transversely of said horizontal axis with the distal ends thereof positioned to engage first stop members carried on one of said units upon a predetermined amount of tilt between said units,

first stop members carried on one of said units in a position to be mutually exclusively engaged by one of the distal ends of said stop engaging member upon said predetermined amount of tilt between said units,

said stop engaging member having a pivotally connected stop engaging element depending from each end thereof in a position to engage a second stop member carried by one of said units upon said predetermined amount of tilt between said units, and

second stop members carried on one of said units in a position to simultaneously and mutually exclusively engage one of said pivotally connected stop engaging elements depending from an end of said stop engaging member when the other end engages one of said first stop members.

4. Apparatus for use in limiting relative tilt between a tractor unit and a trailer unit of an articulated vehicle comprising

pivot means operatively connected to a tractor unit and a trailer unit of an articulated vehicle for enabling said units to tilt relative to each other about a horizontal axis,

a stop engaging member carried by said pivot means and extending transversely of said horizontal axis with C-shaped distal ends positioned to engage a stop member carried on one of said units upon a predetermined amount of tilt between said units,

stop members having an upper and lower engaging surface carried on one of said units adjacent to the distal ends of said stop engaging member and in a position to engage said distal ends of said stop engaging member upon said predetermined amount of tilt between said units,

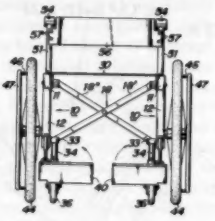
said stop members being positioned for simultaneous engagement of the upper portion of one of said C-shaped distal ends of said stop engaging member with the upper engaging surface of one of said stop members and the lower portion of the opposite C-shaped distal end with the lower engaging surface of the adjacent stop member to distribute stresses when limiting tilt between said units.

4,045,051

FOLDABLE WHEEL CHAIR

Jun Igarashi, Funabashi; Tadao Koga, Fukuoka, and Satoshi Ueda, Kiyose, all of Japan, assignors to Yaesu Rehabili Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,487
Claims priority, application Japan, Apr. 2, 1975, 50-39941; Aug. 21, 1975, 50-101529
Int. Cl.² B62M *1/14*
U.S. Cl. 280—644 **4 Claims**



1. A foldable wheel chair comprising a three-dimensional link mechanism with two opposite side frames including horizontal upper frames with central portions base posts, said central portions being fixed to upper ends of said base posts, front and rear lower frames pivotally mounted on said base posts to swing from the vertical to the horizontal position universal joints, and a pair of diagonal braces pivotally mounted by said universal joints on said upper frames, the front lower frame at their forward ends, and on the upper and rear lower frames, said diagonal braces being folded simultaneously by folding the front and rear lower frames to reduce the distance between said two opposite side frames and simultaneously bring a caster wheel and a drive wheel mounted on the front and rear lower frames closer together.

4,045,052

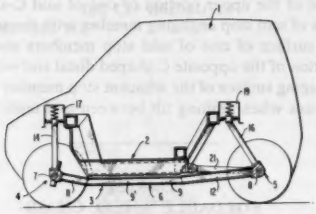
PASSENGER MOTOR VEHICLE

Karl Wilfert, Gerlingen-Waldstadt; Walter Schmid, Sindelfingen, and Arno Jambor, Vaihingen, Enz, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 30, 1975, Ser. No. 573,076
Claims priority, application Germany, May 2, 1974, 2421206
Int. Cl.² B60G *9/00*
U.S. Cl. 280—701 **58 Claims**

1. A passenger motor vehicle comprising a vehicle body, two axle means carrying the vehicle body, said vehicle body being supported with respect to at least one of the two axle means by way of elastic axle guide means, and said vehicle body being rotatable at least with respect to said one axle means about an axis of instantaneous rotation extending generally in the vehicle longitudinal direction and being disposed at least approximately at the height of its center of gravity, characterized in that the elastic axle guide means form simultaneously spring means for a vertical spring system of the one

axle means, and in that said elastic axle guide means are of such construction that the vehicle body is transversely displaceable



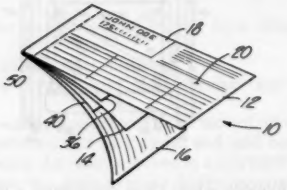
in a translatory manner with respect to at least the one axle means.

4,045,053

CREDIT CARD TRANSFER ASSEMBLY

James L. Carriere, 4678 Lu Ann Drive, Flushing, Mich. 48433

Filed Aug. 15, 1975, Ser. No. 605,214
Int. Cl.² B41L *1/24*
U.S. Cl. 282—22 R **6 Claims**



1. A credit card transfer assembly, comprising:

a. a first transfer medium receiving sheet having an upper surface and a lower surface, the upper surface having a predetermined area for receiving a credit card impression,

b. a second transfer medium receiving sheet having an upper surface and a lower surface, the upper surface having a predetermined area for receiving a credit impression, the predetermined area being coincident with the predetermined area of the first medium receiving sheet, the lower surface having a predetermined area for receiving a credit card impression which is spaced from the upper surface predetermined area to prevent coincidence therebetween,

c. a third transfer medium receiving sheet having an upper surface and a lower surface, the lower surface having a predetermined area for receiving a credit card impression, the predetermined area being coincident with the predetermined area of the lower surface of the second transfer medium receiving sheet,

d. a first transfer medium carrying sheet interposed between the first and second transfer medium receiving sheets,

e. a second transfer medium carrying sheet interposed between the second and third transfer medium sheets, and

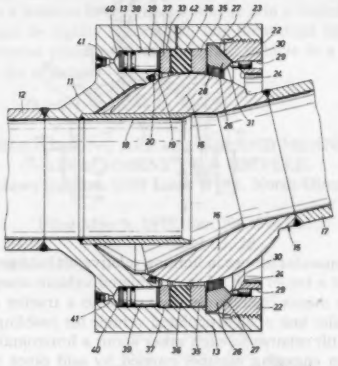
wherein the upper surface of the first transfer medium receiving sheet, carrying sheet and the upper surface of the third transfer medium receiving sheet cooperate to record a first transaction and the third transfer medium receiving sheet, the second transfer medium carrying sheet and the lower surface of the second transfer medium receiving sheet cooperate to record a second transaction upon a 180° rotation of the assembly about a horizontal axis, and further wherein the first transaction is recorded solely upon the upper surface of the first and second transfer medium receiving sheets and the second transaction is recorded solely upon the lower surfaces of the second and third transfer medium receiving sheets.

4,045,054

APPARATUS FOR RIGIDLY INTERCONNECTING MISALIGNED PIPE ENDS

James F. Arnold, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 290,953, Sept. 28, 1972, Pat. No. 3,874,706, which is a continuation-in-part of Ser. No. 189,686, Oct. 15, 1971, abandoned. This application Mar. 14, 1975, Ser. No. 558,427
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **19 Claims**



1. Apparatus for rigidly interconnecting the ends of two pipes comprising:

a pair of coupling members, each of which is adapted for connection at one end thereof to the end of one of said pipes;

one of said coupling members having attached thereto an annular radially outwardly enlarged portion having forward and rearward sides, with said forward side being generally spherical shaped;

the other coupling member having attached thereto a housing having a seat portion adapted for receiving the forward side of said enlarged portion in generally mating engagement therewith, to thereby accommodate axial misalignment between said coupling members;

gripping means supported generally between said housing and said enlarged portion, said gripping means being adapted for radial and axial movement relative to said housing seat portion between a retracted position in which said enlarged portion is freely mateable with said housing seat portion and an extended set position engaging the rearward side of said enlarged portion and urging said enlarged portion into positive contact with said housing seat portion and holding said enlarged portion and said housing rigidly interconnected;

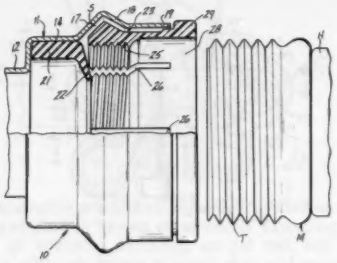
and setting means supported by said housing for urging said gripping means both radially and axially relative to said housing seat portion to said set position of engagement with said rearward side of said enlarged portion with sufficient force to hold said coupling members rigidly interconnected.

4,045,055

QUICK-CONNECT COUPLING

Stephen W. Blakely, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 442,220, Feb. 13, 1974, Pat. No. 3,901,538. This application July 18, 1975, Ser. No. 597,242
Int. Cl.[2] F16L 35/00
U.S. Cl. 285—33 4 Claims



1. A quick-connect coupling device comprising a female coupling member adapted for use with a conventional threaded male coupling member, wherein said female member comprises:

A. a tubular shell member of monolithic construction for receiving said male member comprising a shank portion, a first enlarged portion, a larger main portion, and a mouth portion, said shell member possessing an outer contour identical to its inner contour as defined by said shank portion, said first enlarged portion, said main portion and said mouth portion;

B. a sealing means housed within said first enlarged portion, said sealing means comprising a formed hollow gasket portion and a formed frustoconical lip member extending therefrom, and situated within said first enlarged portion whereby said lip member extends within the inner surface of said male member and is attached to expand radially outward and against said inner surface in response to internal fluid pressure to provide a leak-proof seal;

C. a resilient snap ring possessing at one end thereof internal threads for engaging and holding said male member, and at the same end thereof an outer surface defining an outwardly extended peripheral bevel;

D. a locking means located in said main portion which contacts the peripheral bevel of said snap ring and thereby forces said snap ring radially inward into locking engagement with said male member when removal without release is attempted; and

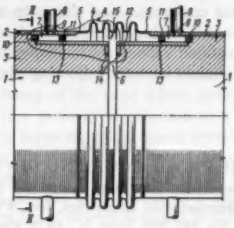
E. release means located on said snap ring for permitting the removal of said male member comprising a longitudinally extended sleeve-like projection which extends beyond said mouth portion, which, when pulled back toward said mouth, releases radially inwardly directed pressure maintained on said snap ring through said bevel, and a plurality of radially displaced, longitudinally extended slits extending through the threaded end of said snap ring defining distinct, finger-like segments at said threaded end, said segments thereby adapted for radially outward movement to facilitate the release of said male member.

4,045,056

EXPANSION COMPENSATOR FOR PIPELINES

Gennady Petrovich Kandakov, Sevastopolsky prospekt 51, kv. 163; Georgy Vasilievich Matveev, Novokhoroshovskoe shosse 25, kv. 58, and Viktor Yakovlevich Miller, Perekopskaya ulitsa 11, kor. 4, kv. 41, all of Moscow, U.S.S.R.

Filed Oct. 14, 1975, Ser. No. 622,393
Int. Cl.[2] F16L 51/02, 53/00
U.S. Cl. 285—41 7 Claims



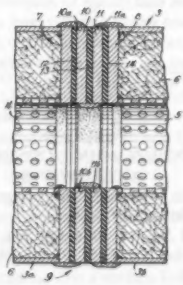
1. An expansion compensator for pipelines of the type including a metal casing lined with refractory materials, said compensator comprising: a corrugated sheath having its ends sealingly connected to said casing of adjacent portions of the pipeline mounted in a spaced relation to one another; shells having a diameter which is substantially smaller than the diameter of said casing, said shells being arranged within said casing; rings disposed between said casing and said shells and sealingly connected thereto; further rings, which are nearest to the space between the adjacent portions of the pipeline, said further rings being disposed between said casing and said shells and connected to one thereof and extending towards the other to define passages for a coolant supply beneath said corrugated sheath; annular distributing chambers for said coolant supply beneath said corrugated sheath arranged at either side of said space and at the inner side of said casing, each of the distributing chambers being formed by the inner surface of said casing, said shell, one of said first-mentioned rings sealingly connected to said casing and said shell and one of said further rings which is the nearest one to said space; and pipes for said coolant supply connected to said annular distributing chambers.

4,045,057

VIBRATION BARRIER/STRUCTURAL CONNECTOR FOR CONDUITS AND THE LIKE

Edmund John Halter, Irving, Tex., assignor to Burgess Industries Incorporated, Dallas, Tex.

Filed Feb. 2, 1976, Ser. No. 654,119
Int. Cl.[2] F16L 55/04
U.S. Cl. 285—49 5 Claims



1. A vibration barrier/structural connector for conduits and the like comprising a plurality of spaced parallel substantially

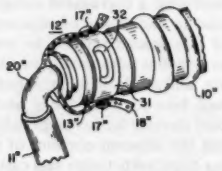
coextensive rigid structural plates, said plates being washer-shaped with outer and inner peripheries, the outermost plate at each end of the connector being adapted to be fastened at one of said peripheries to an end of the conduit in which said connector is to be interposed, said outermost plates being securely fastened to the respective adjoining plates at the other of said peripheries and any intermediate plates being alternately securely fastened together at one and then the other of said peripheries to form a cantilever labyrinth from one end to the other of said connector, and vibration damping bodies composed of material having the vibration damping characteristics of asbestos-filled rubber substantially coextensive with said plates sandwiched between adjoining plates in said labyrinth.

4,045,058

SLIP-PROOF COUPLING DEVICE

Bela Eross, Penn Hills Township, Allegheny County, Pa., assignor to Instrumentation Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 181,705, Sept. 20, 1971, Pat. No. 3,953,060.
This application Apr. 23, 1976, Ser. No. 679,679
Int. Cl.[2] F16L *27/08*; A61M *25/00*
U.S. Cl. 285—119 **1 Claim**



1. A coupling assembly for coupling sections of tubing, comprising a sleeve member to the opposite ends of which sections of tubing may be telescopically connected and an elongated strap the opposite ends of which are removably securable to said sleeve member and which removably cooperates intermediate said ends with at least one of said sections of tubing for elastically maintaining the connection between said section of tubing and said sleeve member, said sleeve member is substantially cylindrical in form and has intermediate the ends thereof a circumferential area of increased diameter, wherein a plurality of mushroom-like buttons are fixed in diametrical relation externally on said circumferential area, wherein said strap has a series of holes longitudinally spaced therein smaller in diameter than the said buttons but expandable thereover to secure said strap thereto, said one section of tubing has an annular flange spaced from one end thereof, said strap has an enlarged hole intermediate said ends, wherein the intermediate portion of the strap surrounds said one section of tubing and engages said flange to rotatably hold said one section of tubing to said sleeve member, and wherein an elongated circumferentially extending opening through said circumferential area is provided for unrestricted venting communication to atmosphere from within said sleeve.

4,045,059

MULTIPLE CONDUIT JOINT, CONSTANT INTERFACE AREA SWIVEL

Jack Edward Smith, Whittier, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 14, 1976, Ser. No. 649,031
Int. Cl.[2] F16L *27/08, 43/00*
U.S. Cl. 285—181 **5 Claims**

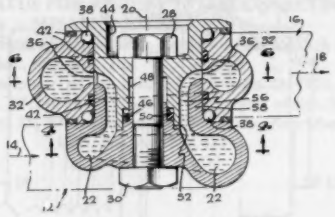
1. A multiple conduit joint, comprising in combination:

a. a first conduit having an ingress and a conducting port;

b. a second conduit articulate with said first conduit and having an egress and a conducting port opening to said first conduit conducting port in a substantially matching area of complemental joinder;

c. said first conduit being articulate about said second conduit thereby defining an axis of articulation;

d. each of said conduits being provided with a tapered chamber coupled in fluid communication to said ingress and said egress ports respectively, opening on said matching, complemental area of joinder defining a continuous, undivided channel forming a fluid path through said conduits, the orientation of any length of said path bypassing said axis, said path following a curve winding around said axis without intersecting said axis; and



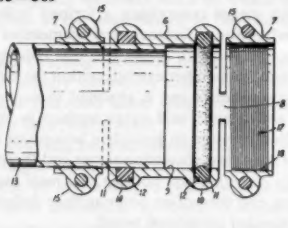
e. a cross-sectional area of said tapered chamber of said first conduit complements a cross-sectional area of said tapered chamber of said second conduit so that any plane intersecting the tapered chamber of said first conduit and the tapered chamber of said second conduit will have a cross-sectional total area of intersection approximately equal to a cross-sectional total area of intersection of any other plane intersecting said first conduit or said second conduit where said planes are coaxial with said axis of articulated movement.

4,045,060

PIPE RETAINER JOINTS

Rosaire Daigle, St. Lambert, Canada, assignor to Daigle Aqua Inc., Quebec, Canada

Filed Jan. 12, 1976, Ser. No. 648,046
Claims priority, application Canada, Dec. 4, 1975, 241069
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—369 **5 Claims**

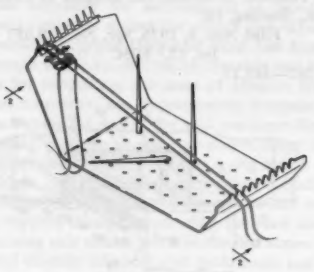


1. A pipe retaning joint for joining lengths of pipe, comprising a unitary coupling member having a central cylindrical member and a pair of split pipe retaining end members, each end member being split at diametrically opposite points, the said end members being joined to the said central member by integral narrow lugs located midway between th splits in the end members and retaining the said central and end members in axial alignment, the said central member having a pair of axially spaced apart annular grooves on its inner surface and an O-ring seated in each of said annular grooves, the said split end members each having their internal surface grooved to form pipe gripping surfaces, and bolt means for contracting the said split end members to bring them into gripping engagement with the pipes to be joined and to hold the pipes against axial withdrawal from the central member of the pipe retaining joint.

4,045,061
DECORATIVE ARTICLE FORMING SUPPORT

Mary M. Fierro, 11619 Downey Ave., Downey, Calif. 90241

Filed Apr. 14, 1976, Ser. No. 676,938
Int. Cl.[2] B65H *69/04*
U.S. Cl. 289—18 2 Claims

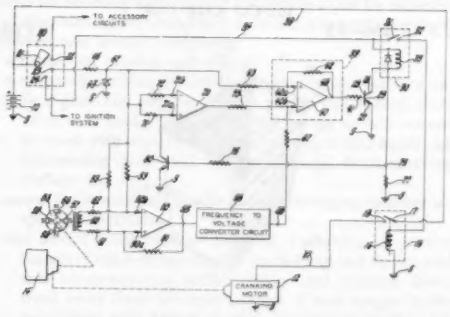


1. A decorative article forming support including:
a support portion having an upwardly extending first end and an upwardly extending second end, said first end being relatively longer in length than said second end so that said first end extends above said second end, wherein the area between the extended ends of said first end and said second end define a plane whereby said decorative article is adapted to be positioned, said first end and said second end being angled away from each other,
a plurality of V-shaped slots placed on said second ends and adapted to securely hold selected end of the decorative article being formed, and
removably mounted means on said first end for holding the end opposite said selected end of the decorative article being formed, said means including an elongated bar having a slot disposed in an elongated plane thereof, said slot being adapted to be snugly placed over said first end thereof and secure said means to said end, and a plurality of spaced pins extending from said bar on a side opposite said slot, whereby said decorative article being formed is adapted to be positioned between said pins and said V-shaped slots.

4,045,062
ELECTRIC CRANKING MOTOR AUTOMATIC DISCONNECT AND LOCKOUT CIRCUIT

Mark D. Disosway, III, Anderson, and Leonard J. Sheldrake, Noblesville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1975, Ser. No. 641,444
Int. Cl.[2] F02N *11/08*
U.S. Cl. 290—38 R 2 Claims



2. An electric cranking motor automatic disconnect and lockout circuit of the type effective to automatically interrupt and lock out the electrically energizable energizing circuit for an internal combustion engine electric cranking motor when the speed of the cranked engine reaches and exceeds a predetermined value comprising in combination with an electric switch having "Off", "Run", and "Crank" positions:
an electrical switching device effective to establish and interrupt the internal combustion engine cranking motor electrically energizable energizing circuit and being of the type operable to an electrical circuit closed condition and to an electrical circuit open condition in response to respective applied electrical signals of a first polarity and of another polarity;
first circuit means having first and second input circuit means and being of the type which produces an output signal of a first polarity in response to a said first input circuit means input electrical signal level of a magnitude greater than the said second input circuit means input electrical signal level and which produces an output signal of a second polarity in response to a said second input circuit means input electrical signal level of a magnitude greater than the said first input circuit means input electrical signal level;
means for applying an electrical reference signal of a substantially constant magnitude and of a selected polarity to one of said first and second input circuit means of said first circuit means while said electric switch is in both the said "Run" and "Crank" positions;
means for producing an electrical engine speed signal of the same said selected polarity as said reference signal and of a magnitude directly proportional to the speed of an associated cranked internal combustion engine while said engine is in both the "Crank" and "Run" modes;
means for applying said engine speed signal to the other one of said first and second input circuit means of said first circuit means whereby said first circuit means produces a combination automatic disconnect and lockout electrical output signal of the polarity to which said electrical switching device is responsive for operation to the electrical circuit open condition when the level of said engine speed signal reaches and exceeds that of said reference signal;
means for applying said output signals of said first circuit means to said electrical switching device whereby said electrical switching device is operated to the electrical circuit open condition when the speed of said cranked engine reaches and exceeds said predetermined value; and
second circuit means for producing an electrical auxiliary lockout signal of the same polarity as said reference and engine speed signals in response to the operation of said second electrical switching device to the electrical circuit open condition and for applying said auxiliary lockout signal to the same one of said first and second input circuit means of said first circuit means as is said engine speed signal.

4,045,063
LOAD REGULATING LATCH

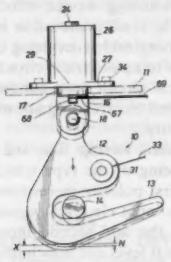
James C. Fletcher, Administrator of the National Aeronautics And Space Administration, with respect to an invention of, Walter Thomas Appleberry, Long Beach, Calif.

Filed Dec. 18, 1975, Ser. No. 641,784
Int. Cl.[2] E05C *5/04*
U.S. Cl. 292—110 25 Claims

1. A load-regulating mechanical latch, comprising:
a prepositioned strike roller;
a latch element adapted for pivotal mounting comprising a laterally open hook having a surface for engagement with said strike roller;
means for pivotally moving said latch element;
a latch stem having pivotal mounting means at one end for pivotal mounting to said latch element;

a support bracket having an opening therein for receiving and supporting said latch stem;

adjustable loading means cooperating with said latch stem



and said support bracket for permitting selected axial movement of said latch stem whereby a predetermined load is exerted between said latch element strike roller-engaging surface and said strike roller.

4,045,064

LATCH MECHANISM

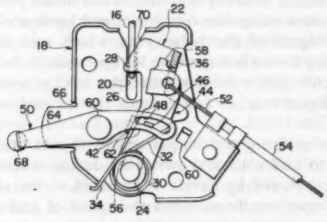
Yasumasa Okada, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 13, 1976, Ser. No. 648,690

Claims priority, application Japan, Jan. 17, 1975, 50-7511; Aug. 27, 1975, 50-118591[U]

Int. Cl.[2] E05C *3/30*

U.S. Cl. 292—125 **9 Claims**



1. In an automobile:

a luggage compartment to be closed by a lid;

a passenger compartment;

a latch mechanism having a latch member mounted within said luggage compartment, an open member mounted within said luggage compartment, said latch and open members being in conjoint action in a first condition and out of conjoint action in a second condition, whereby when in said first condition, said open member is operable to move said latch to its open position and when in said second condition said open member is inoperable to move said latch to its open position, and manually operable means for selectively rendering said latch and open members to the first and second conditions, said manually operable means being mounted within said luggage compartment so that when said lid is closed, said manually operable means is inaccessible for being manually operated; and

control means mounted within said passenger compartment for actuating said open member, said control means being operable from said passenger compartment only, whereby when said lid is closed with said manually operable means conditioned to render said latch and open members to the second condition, manual operation of said control means is inoperative to move said latch member to its open position.

4,045,065

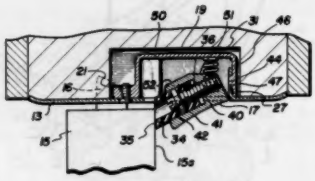
RELEASABLE DOOR STOP AND STRIKE PLATE ASSEMBLY FOR A BIDIRECTIONAL SWINGING DOOR

Larry K. Johnson, Morrison, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Nov. 6, 1975, Ser. No. 629,657

Int. Cl.[2] E05C *3/02*

U.S. Cl. 292—341.17 **8 Claims**



1. A door stop assembly for a bidirectional swinging door to permit opening of a door in a first direction during normal use and to permit selective opening of the door in a second direction during an emergency, comprising in combination: a face plate adapted to be fastened to a doorway frame and having a first aperture formed therein to receive the latch element of the door to provide a striker aperture therefore, a second aperture formed in said plate and offset laterally of said first latch receiving aperture, housing means secured to said face plate in registry with said second aperture for insertion into a mortise formed in the doorway frame receiving the same, a depressible stop member movably positioned within said housing means, said stop member including a main body element having a portion thereof projecting from said plate through said second aperture, and a bumper element carried by said portion of the main body element and having an abutment surface facing said first aperture for engagement by a door to provide the stop for said door, and means mounting said bumper element to said main body portion for movement toward or away from said first aperture, including means for maintaining a selective position, whereby the position of said stop relative to said strike may be adjusted and maintained to keep said door firmly engaged against said stop when in the closed condition with the door latch engaged in said first aperture.

4,045,066

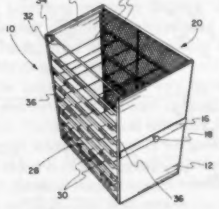
BULK TOBACCO CONTAINER

J. Curtis Griffin, and Clyde C. Griffin, both of Branford, Fla., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed June 25, 1976, Ser. No. 699,671

Int. Cl.[2] A24B *1/08*

U.S. Cl. 294—5.5 **10 Claims**



1. In a bulk tobacco container of the type which when oriented in an upright curing and drying position includes later-

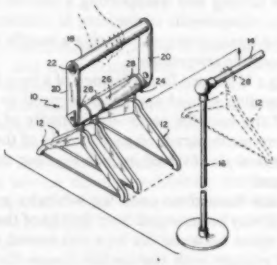
ally spaced side retaining means; back retaining means extending across the back of said container and extending between said laterally spaced side retaining means; front tine frame support means extending across the front of said container and between said laterally spaced side retaining means so as to define an area within said container for containing a mass of tobacco leaf material; open areas about both the top and bottom of said container for allowing air to move vertically through said container during the curing and drying process; and tine means extending from said front tine frame support means through said mass of tobacco towards said back retaining means for supporting the mass of tobacco leaf material within said container; the improvement comprising an improved back retaining means for said container for receiving and supporting portions of said tine means about the back of said container, said improved back retaining means as oriented in said upright curing and drying position including a back frame having a plurality of vertically spaced and transversely extending support members extending between said laterally spaced retaining side means; and a perforated screen-like member disposed directly adjacent said back frame and the transverse members thereof and extending substantially over the entire area of said back retaining means for receiving and supporting portions of said tine means that extend through the mass of tobacco leaf material about the back of said container.

4,045,067

APPARATUS AND METHOD FOR HANDLING GARMENT HANGERS

Rodney L. Wieder, P.O. Box 86, R.D. No. 1, Coopersburg, Pa. 18036; Michael A. Neetz, 2433-Apt. 105, Prospect Ave., Allentown, Pa. 18103, and Earl O. Sell, 53 Buckeye Road, Emmaus, Pa. 18049

Filed Nov. 1, 1976, Ser. No. 737,474
Int. Cl.[2] A47G *25/06*
U.S. Cl. 294—15 **6 Claims**



1. A device for handling garment hangers of the type including a supporting hook adapted to be hung on a generally horizontal supporting bar in a garment rack, said device being useful for handling a plurality of hangers as a unit for mounting and dismounting on supporting bars and transportation therebetween, said device comprising:

a handle for holding said device;

a scooping member including a hanger hook-receiving surface generally parallel to said handle and spaced therefrom, said hook-receiving surface having surface normals inclined with respect to a plane parallel to said handle and intersecting both said handle and said hook-receiving surface; and

means for joining said handle and said scooping member in a spaced relationship;

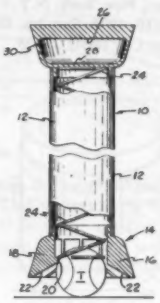
said device being used to dismount a plurality of garment hangers from a supporting bar by holding said device with said hook-receiving surface below and inclined downward away from the open portion of said hanger hooks, and lifting said device so that said hanger hooks slide down said hook receiving surface and are simultaneously lifted from said bar, said hangers being placed on a bar by lowering said device towards and below said bar so that said hanger hooks engage said bar.

4,045,068

BALL PICK-UP, STORAGE, AND INDIVIDUAL DELIVERY DEVICE

James Irwin Nelson, R.D. 2, Ironia Road, Mendham, N.J. 07945

Filed May 19, 1976, Ser. No. 687,915
Int. Cl.[2] A63B *47/02*
U.S. Cl. 294—19 A **3 Claims**



1. A tennis ball pick-up, storage, and individual delivery device comprising: an elongated tubular canister for receiving and storing and individually delivering a plurality of tennis balls; tennis ball guiding and retaining means located at one end of said elongated tubular canister for guiding tennis balls individually into said elongated tubular canister and for retaining them therein, said tennis ball guiding and retaining means being located at the lower end of said elongated tubular canister when the tennis balls are to be guided into said elongated tubular canister and at the upper end of said elongated tubular canister when the tennis balls are to be delivered from said elongated tubular canister; spring means located within said elongated tubular canister for urging the tennis balls within said elongated tubular canister in the direction of said tennis ball guiding and retaining means, with the outermost tennis ball contacting said tennis ball guiding and retaining means; and a sufficiently enlarged base located at the other end of said elongated tubular canister opposite to the end where said tennis ball guiding and retaining means are located, providing a handle for the person picking up tennis balls with the tennis ball pick-up, storage, and individual delivery device and having a sufficiently large surface base area to enable said elongated tubular canister to be inverted and to stand substantially vertically upright thereon in inverted but stable fashion on the ground or on the playing surface of a tennis court, with said tennis ball guiding and retaining means being located at the upper end of said elongated tubular canister when the tennis balls are to be individually delivered from said elongated tubular canister and with the outermost tennis ball in position to be removed individually at a constant height at approximately waist-high level or above from said elongated tubular canister by a person using the tennis ball pick-up, storage, and individual delivery device without being required to bend over or stoop during either the picking-up or delivering of the tennis balls, said tennis balls being squeezable and compressible, and capable of being deformed and distorted by manual or digital pressure but being sufficiently resilient as to return substantially immediately to their original spherical shape when the manual or digital pressure is removed, said tennis ball guiding and retaining means comprising a plurality of relatively firm, rigid and unyielding fins which are sufficiently spaced from each other as to permit the fingers of a person using the device to enter therebetween to grasp and remove tennis balls individually, said relatively firm, rigid and unyielding fins extending radially outwardly from the center or axis of said elongated

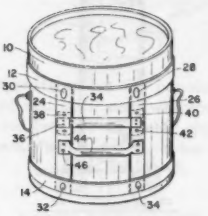
tubular canister, with their inner ends forming an opening slightly smaller than the cross-sectional area of a tennis ball, whereby pressure is required to squeeze and deform the tennis balls to enable them to be collected and guided into said elongated tubular canister or to permit them to be delivered individually from said elongated tubular canister.

4,045,069

PAINT BUCKET HOLDER

Clemens L. Fife, Baton Rouge, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed June 10, 1976, Ser. No. 694,677
Int. Cl.[2] B65D *25/28*
U.S. Cl. 294—31.2 **3 Claims**



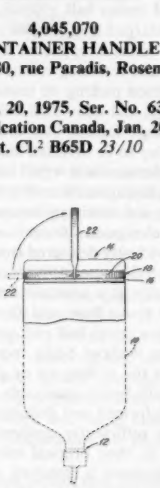
1. A paint bucket holder, comprising:
a strap releaseably secured around an upper portion of a paint bucket by means of a buckle,
a second strap releaseably secured around a lower portion of the paint bucket by second buckle,
a vertical strap connected between the strap and the second strap,
a second vertical strap connected between the strap and the second strap near the vertical strap,
a wooden handle attached at each end to a connected strap, each connecting strap secured to one of the vertical straps, and
a metal handle secured beneath the wooden handle to the vertical straps.

4,045,070

CONTAINER HANDLE

Wolfgang Geisinger, 180, rue Paradis, Rosemere, Quebec, Canada

Filed Nov. 20, 1975, Ser. No. 633,789
Claims priority, application Canada, Jan. 20, 1975, 218239/75
Int. Cl.[2] B65D *23/10*
U.S. Cl. 294—31.2 **5 Claims**



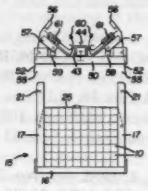
1. A handle for insuring the vertical positioning of an inverted suspended bottle having an external circumferential groove adjacent one end thereof, said bottle being used principally for administering intravenous solutions to patients, comprising: an endless band of thermoplastic material, said material being resiliently stretchable for passage over said one end of said bottle to be received in said groove firmly; a bail molded integrally with said band to form a unitary structure, said bail including a pair of arm portions and; flat connecting portions joined respectively at the end of each arm portion to generally diametrically opposed portions of said band; each said flat connecting portion extending outward from said band in a plane parallel to the plane of said band and having a reduced cross-section and resiliency compared to the cross-section and resiliency of the arm portion, said reduced cross-section providing a twistable hinge at the junction between said bail and said band allowing said bail to rotate 90° relative to said plane of said band to insure the vertical positioning of said bottle when suspended.

4,045,071

SYSTEM FOR TRANSPORTING AND STORING LONG EXTRUSIONS

James W. Dunstan, Kalamazoo, Mich., assignor to Acorn Building Components, Inc., Detroit, Mich.

Filed Jan. 5, 1976, Ser. No. 640,127
Int. Cl.[2] B66C *1/18*
U.S. Cl. 294—67 R **12 Claims**



12. A system for storing and transporting a bundle of elongated extrusion-like components comprising in combination:
a pair of racks for transporting and storing a bundle of elongated, extrusion-like components;
each rack having a U-shaped frame formed of a base and two upwardly extending spaced apart legs secured to the opposite ends of the base for receiving a bundle of stacked elongated components arranged transversely of the frame;
an elongated vertical slot formed in each leg near the upper end thereof; and
first anchor means formed on each leg whereby a flexible strapping band may be arranged over the top of the bundle and span the space between the legs and extend through the slots and engage with the anchor means for tightly securing the bundle within the frame provided that the height of the bundle above the frame base is greater than the height of the lower end of the slot above the base;
second anchor means formed on each leg near the upper end of its slot whereby the frame and its bundle may be lifted by engaging the first or second anchor means with a lifting hoist means;
an elongated beam of adjustable working length;
fastener means securing the working length of the beam at a length substantially equal to the distance between said racks;
a pair of rack-engaging units each secured to one end of the beam so that upon positioning the rack-engaging units over a racked bundle, each rack-engaging unit is aligned above a rack; and
locking means for engaging each rack-engaging unit with the anchor means of its associated rack,
each rack engaging unit including: an elongated yoke secured to one end of the beam and mounted transversely thereof;
a pair of arms each having upper and lower ends and pivotally mounted at one end of said yoke intermediate its upper and lower ends;

each arm counterbalanced so that the lower end of each arm is normaly in a non-rack engaging position solely by the influence of gravity; and

locking means cooperating with the upper end of each arm for pivoting each arm so that the lower end engages a rack and so that the upper end of each arm is positively locked against pivoting.

4,045,072

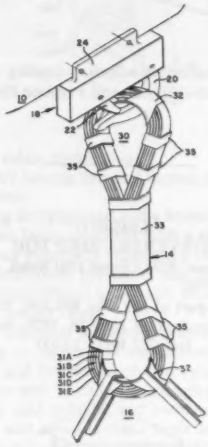
ABRASION RESISTANT BOOT

Frank J. Brown, Willow Grove, Pa., assignor to United Technology, Inc., Blue Bell, Pa.

Filed May 18, 1976, Ser. No. 687,627

Int. Cl.[2] B66C *1/12*

U.S. Cl. 294—74 **9 Claims**



1. A protective boot for use in conjunction with a support member, said boot comprising a first member of relatively flexible material, a second member of relatively inflexible material attached to said first member, said second member being somewhat smaller in width than said first member and being of such configuration so as to form a pocket, and an insert of a size to substantially fill said pocket, said insert comprising a woven member exhibiting preferred characteristics when subjected to large compressive stresses whereby longitudinally oriented fibers of said woven member exhibit a relatively high resistivity to compression while the transversely oriented fibers exhibit a relatively low resistivity to compression so that when said boot is subjected to impact forces of substantial magnitude a failure of the transversely oriented fibers occurs without a corresponding failure of the longitudinally oriented fibers thereby permitting the impact forces to be distributed over the length of said insert.

4,045,073

DEVICE FOR DISPLACING AN EGG-TRAY

Jacob Hendrik Mosterd, Barneveld, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed Apr. 2, 1976, Ser. No. 673,141

Claims priority, application Netherlands, Apr. 11, 1975, 7504326

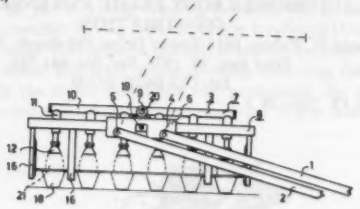
Int. Cl.[2] B66C *1/02, 1/46*

U.S. Cl. 294—87 A **8 Claims**

1. A gripper device for displacing an egg-tray filled with eggs comprising:

supporting members movable in a generally horizontal direction into engagement with a rim of an egg-tray, said supporting members having an edge gripping portion of a height greater than the thickness of the rim of the tray, said thickness being taken in a vertical direction, such that the vertical position of the rim can be varied over a given range, relative to the said edge gripping portion, and still be positioned to be gripped by the edge gripping portion and hence carried by the supporting members,

a suction device comprising means for engaging the eggs in the tray by suction to support the weight of the eggs therein,



and means for fixing the height of the supporting members relative to the suction device and moving them together to thereby carry away the egg-tray filled with eggs with the suction device bearing the weight of the eggs and supporting members bearing the weight of the tray.

4,045,074

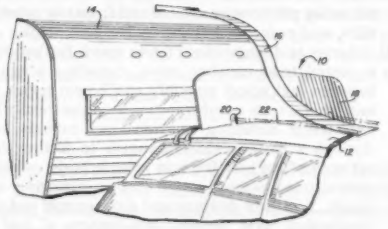
AIRSTREAM DEFLECTOR FOR TRAILER-TOW VEHICLE COMBINATIONS

George W. Howard, Northbrook, Ill., assignor to Leisure Manufacturing Co., Inc., Des Plaines, Ill.

Filed Apr. 15, 1976, Ser. No. 677,239

Int. Cl.[2] B60J *9/04;* B62D *35/00*

U.S. Cl. 296—1 S **15 Claims**



1. A collapsible airstream deflector device adapted to be mounted on the roof of a towing vehicle to deflect air over a towed vehicle when said vehicles are in motion, comprising:

A. a generally planar, rigid, rectangular deflecting member of sheetlike material adapted to be mounted transversely of the towing vehicle roof;

B. support means for enabling the deflecting member to be secured to said roof, said support means comprising:

1. a pair of stabilizing members, each stabilizing member having first and second arms rigidly connected to one another at an angle relative to one another;

the first arms being arranged generally parallel to one another and each being pivotally connected on an axis substantially parallel to the rear surface of said deflecting member at locations adjacent opposite ends of the member, and able to rotate on said axis parallel to the deflecting member when disassociated from the towing vehicle to enable each second arm to be swung between a first operative position where said first and second arms define a plane generally perpendicular to that of the deflecting member and a second position in which each second arm overlies the rear surface close thereto;

C. locking means for removably locking said deflecting

member and support means with the stabilizing members in said first operative position; and

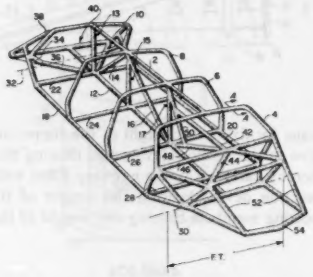
D. means for connecting the deflector device to the towing vehicle.

4,045,075

AUTOMOBILE BODY FRAME AND ENVELOPE CONSTRUCTION

Donald W. Pulver, 1616 Trolist Drive, Pittsburgh, Pa. 15241

Filed Dec. 18, 1975, Ser. No. 641,785
Int. Cl.[2] B62D *21/00*
U.S. Cl. 296—28 J **21 Claims**



1. A vehicle body frame and envelope construction for an elongated wheelbased vehicle of relatively narrow track having an aspect ratio for wheelbase to track of between approximately 2:1 and 3:1 comprising:

A. longitudinal frame means between points of attachment for a front wheel assembly and a rear wheel assembly, said points defining said vehicle wheelbase, and

B. transverse frame means between and encompassing wheel mounting positions on each of said front rear wheel assemblies, said positions defining said vehicle track,

C. wherein said longitudinal frame means further comprises a central truss member means extending longitudinally between said wheel assembly attachment points wherein said central truss member means is symmetrically between said wheel mounting positions and extends vertically through a passenger compartment to further define an upper roof support for said vehicle body, wherein said central truss member means further comprises an upper longitudinal strut defining said roof support and a bottom longitudinal strut defining the bottom of said vehicle frame, said struts being vertically interconnected by respective vertical struts at spaced longitudinal positions along said longitudinal struts.

4,045,076

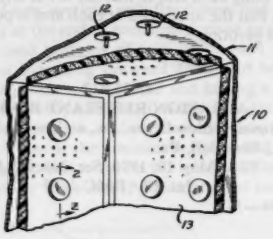
SYSTEM FOR REMOVABLY SECURING SOUND-PROOFING MATERIAL TO A CONSTRUCTION VEHICLE

Lloyd Franklin Day, Sr., West Linn; Jarvis Cathralle Buxton, Portland; Lary Hester Oliver, Portland, and Randall Jay Le Neve, Portland, all of Oreg., assignors to Portland Wire & Iron Works, Portland, Oreg.

Filed Mar. 29, 1976, Ser. No. 671,060
Int. Cl.[2] E04B *1/74*
U.S. Cl. 296—39 A **7 Claims**

1. In apparatus for applying sheet-like material to areas of a vehicle surrounded by walls including a plurality of externally grooved stud assemblies secured at spaced locations to said wall and projecting inwardly thereof to provide a non-pointed distal end; a layer of said material covering the interior of said walls, said assemblies projecting at least partially through said material; and a button for each assembly, including a head and sleeve for fitting over an associated stud assembly and being held by the grooves thereof,

the improvement wherein said stud assemblies comprise a flat, thin base, a grooved stud attached to said base and extending perpendicular to a front face of said base, a layer of flexible foam material on the back side of said



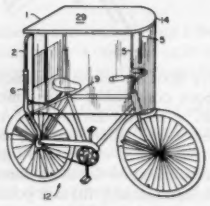
base; pressure-sensitive adhesive coating on the exterior side of said foam material; and a release film covering said adhesive.

4,045,077

CONVERTRA-BIKE TOP

James Milton DeVone, 3022 Chapel Hill Road, Apartment 70-C, Durham, N.C. 27703

Continuation-in-part of Ser. No. 598,666, Nov. 23, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,916
Int. Cl.[2] B62J *17/00*
U.S. Cl. 296—78.1 **2 Claims**



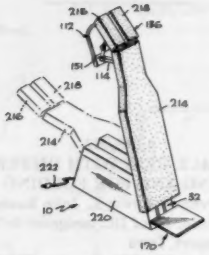
1. A multipurpose top for cycle type vehicles having a frame and a seat for a rider, comprising: a substantially rigid, elongated top frame, generally planar in construction and C-shaped at one extremity and straight at the other extremity; a pair of generally tubular, elongated, L-shaped combination shield guard and table leg members mounted generally parallel to the bottom surface of said top frame; clamp means securing said L-shaped guard members to said top frame; a plurality of detachable elongated generally divergent combination side supports and table legs vertically disposed between and attached to the vehicle frame on one end and said top frame on the other end; a plurality of detachable, elongated generally divergent tubular side arm members disposed generally horizontally and connected at one end to the vehicle seat mounting bracket and at the other end to, respectively, one of said side support members; and a combination top cover means and table top constructed of generally weatherproof material enveloping said top frame and comprising a plurality of sections including a combination weather shield and storage area at the rear of the seat of the vehicle, and a transparent weather shield extending about the sides and front of the vehicle whereby a multi-purpose top is provided which can be used as either a top or a removable table and, when in the cycle top configuration, provides a weather shield and storage area.

4,045,078

TILTING THERAPEUTIC TABLE

Alfred C. Shine, North Hollywood, Calif., assignor to Daniel J. Clinton, Hollywood, Calif.

Filed Oct. 20, 1976, Ser. No. 734,024
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—324 **6 Claims**



1. A tiltable table, comprising:
a base member having first and second ends and an intermediate portion;
a plate having an upper end and a lower end, said lower end of said plate being provided with a pair of wrist pins;
a bearing block swingably connecting each of said wrist pins to said intermediate portion of said base member;
an electric motor affixed to one side of said plate, said motor having an output shaft;
a screw-jack assembly including a vertically-movable cylinder having an upper end and a lower end, a drive nut affixed to said lower end of said cylinder, a drive screw having one end threadedly engaging said drive nut to reciprocate said cylinder and another end drivingly connected to said motor output shaft and a screw bearing block rotatably receiving said another end of said drive screw;
means affixing said screw bearing block to the other side of said plate;
a table support including a pair of channel members each having an upper end and a lower end;
means affixing the lower end of each channel member to said one end of said base member for maintaining said channel members in spaced-apart, near-vertical positions;
a one-piece, elongated tubular member having first and second ends and an intermediate portion;
a pivot pin swingably connecting the portion of said tubular member which lies between its first end and its intermediate portion to said table support between said upper ends of said channel members;
means pivotably connecting said upper end of said cylinder to said tubular member between said pivot pin and said intermediate portion for swinging said tubular member from a horizontal plane to a near-vertical plane;
a foot rest swingably connected to said first end of said tubular member; and
a head rest swingably connected to said second end of said tubular member.

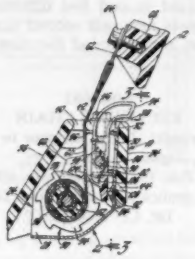
4,045,079

INERTIA SEAT BACK LOCK

Alfonsas Arlauskas, Troy, and Richard D. Loose, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1976, Ser. No. 686,693
Int. Cl.[2] B60R *21/10*; A47C *1/00*
U.S. Cl. 297—216 **5 Claims**

1. An inertia seat back lock for a seat back member pivotal relative to a seat cushion member comprising, in combination, a frame secured to one of the members and including spaced side walls, a reel including a shaft portion and a pair of toothed plates, each located adjacent a respective side wall and including a plurality of radially extending teeth, means rotatably mounting the shaft portion on the frame side walls, a strap secured at one end of the reel for winding and unwinding therefrom, means securing the other end of the strap to the other member, spring means located between a respective plate and side wall and interconnecting the reel and frame to normally bias the reel in a strap winding direction, and an inertia responsive member having a pawl portion traversing the reel plates and a pair of extensions located between a reel plate and respective frame side wall, means pivotally mounting the extensions on the frame side walls and positioning the pawl portion to one side of the pivotal mounting means and the



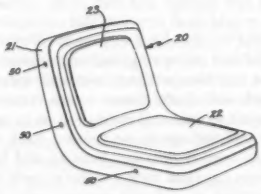
extensions to the other side thereof, the extensions being of predetermined weight and locating the center of gravity of the inertia member to the other side of the pivotal mounting means to normally bias the inertia member in one direction about the pivotal mounting means, and means limiting movement of the inertia member in the one direction to locate the pawl portion of the inertia member in a predetermined position out of the path of the teeth of the reel plates, a predetermined seat deceleration level pivoting the inertia member in the other direction relative to the pivotal mounting means and engaging the pawl portion with one tooth of each reel plate to block unwinding movement of the strap and pivotal movement of the seat back member relative to the seat cushion member.

4,045,080

FASTENING SYSTEM FOR REMOVABLE SEAT INSERT

Chester J. Barecki, Grand Rapids, and Larry A. Wilkerson, Wyoming, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Nov. 3, 1976, Ser. No. 738,566
Int. Cl.[2] A47C *27/00*
U.S. Cl. 297—283 **11 Claims**



1. In a seat having a rigid plastic shell and means for fastening said insert to the shell, the improvement comprising:
studs secured to and protruding from the back of said insert, said studs having a shank portion and an enlarged head;
said shell having openings for receiving said studs, said openings being sufficiently large to receive the heads of said studs;
an elongated retainer member mounted on said shell for movement in two sequential first and second directions

extending at angles from each other so said retainer member can be positioned in a retaining position and a non-retaining position;

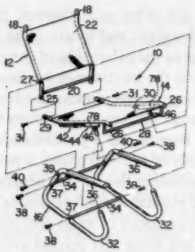
said retainer member having notched portions one for receiving each of said shanks of said studs, so that the retainer member is located between the heads of said studs and said shell, at least one of said notched portions in the retaining position of said retainer member having a first slot portion extending in one of said directions and a second connecting slot portion communicating with said first slot and extending in the other of said directions whereby when said retainer is moved from the non-retaining position to the retaining position one of said studs enters and passes through said first slot portion as said retainer is moved in said first direction and thereafter enters and passes into said second slot as said retainer member moves in said second direction.

4,045,081

RECLINING CHAIR

Kiyoshi Ueno, Kawasaki, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Feb. 13, 1976, Ser. No. 658,117
Claims priority, application Japan, June 24, 1975, 50-78409
Int. Cl.[2] A47C 1/02
U.S. Cl. 297—317 **5 Claims**



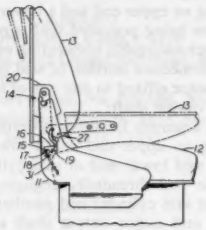
1. A reclining chair comprising: a seat section having a front end and a rear end, a back-rest section having a lower end rockably and separably connected to the rear end of said seat section; a frame section rockably and separably connected to said back-rest section and including a pair of mutually separably connected side frames and an upwardly extending portion; a friction brake apparatus tilted to one side of said seat section and including a housing, a slidable shaft having one end extended through said housing, a pair of coil springs differing in twisted direction from each other and fitted over said shaft so as to grip said shaft thereby to lock said shaft by frictional force between said coil springs and said shaft, release means rockably fitted over said shaft between said coil springs in a manner allowed to abut on the distal coil ends of mutually opposing end portions of said coil springs and so designed that when said release means has been rocked, said coil springs are twisted back to unlock said shaft, sleeve means received within said housing adjacent to said coil springs so as to cause respective coils of said coil springs to be twisted back uniformly, and bushing means fixed within said housing and having a pair of engaging means engaged with the distal bent coil ends of the other end portions of said coil springs, respectively, so as to prevent them from being rocked, and a pair of inclined shoulders each having a larger angle of inclination than the helical angle of said coil springs and abutting on the distal coil end of said other end portions of said coil springs, respectively; and coupling means for slidably coupling said seat section to said frame section through said brake apparatus, said coupling means including a fitting for fitting said housing of said brake apparatus to said seat section and a coupling mechanism for fixedly coupling an extended end portion of said shaft of said brake apparatus to said frame section, said coupling means including a connector separably fitted into said upwardly extending portion thereby slidably coupling said seat section to said frame section.

4,045,082

SEAT HAVING BACK REST WITH DIFFERENT PIVOTS FOR TILTING AND FOR FOLDING LEVEL

Allen C. Egert, Davenport, Iowa; L. John Koutsky, Milan, and Dale R. Ropp, Aledo, all of Ill., assignors to Sears Manufacturing Co., Davenport, Iowa

Filed Sept. 22, 1976, Ser. No. 725,398
Int. Cl.[2] A47C 1/025
U.S. Cl. 297—357 **5 Claims**



1. In a seat assembly having a rigid seat frame, a seat cushion and a back rest supported by said frame,

a first separable pivot connecting said back rest to said seat frame, said first separable pivot being on that transverse axis of said back rest about which said back rest is to be rotated for adjustment of tilt,

locking means spaced from said first pivot and connecting said back rest and said seat frame in different selected degrees of tilt of said back rest,

a second separable pivot on a different transverse axis of said back rest, said second separable pivot connecting said back rest to said seat frame during rotation of said back rest to a folded position over said seat cushion,

said first separable pivot comprising a stud and a first arcuate bearing connected individually to said back rest and said seat frame, said first arcuate bearing being open in an upwardly direction, a guiding edge extending from an upper portion of said first arcuate bearing in a substantially horizontal direction such that said bolt is movable thereover for supporting said back rest until said bolt is free while said back rest is lifted slightly upwardly and then the upper portion of said back rest is tilted forwardly,

said second pivot comprising a pintle and a second arcuate bearing connected individually to said back rest and said seat frame, said second pivot being separated while said back rest is in position for use,

guiding means connecting said back rest to said seat frame, said guiding means cooperating with said guiding edge to position said pintle within said second arcuate bearing surface as said stud is removed from said first arcuate bearing and moved along said guiding edge, and said guiding means maintaining said pintle within said second arcuate bearing while said back rest is rotated to said folded position around said different transverse axis.

4,045,083

LONGWALL MINING MACHINE WITH HAULAGE MOTOR SENSED PRESSURE CONTROLLED RAIL BRAKE

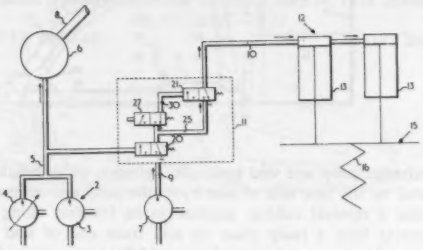
Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 13, 1976, Ser. No. 657,876

Claims priority, application United Kingdom, Feb. 28, 1975, 08436/75

Int. Cl.[2] E21C *29/16*

U.S. Cl. 299—1 11 Claims



1. A mineral mining machine comprising haulage mechanism including a hydraulic motor for hauling the machine to and fro along a rail extending along a longwall face, first hydraulic pump means for feeding pressure fluid to drive the hydraulic motor, a first hydraulic control for controlling the feed of pressure fluid to said hydraulic motor, a resiliently biased rail-engaging brake operable under its resilient bias towards its applied position to prevent movement of the machine along said path, second hudraulic pump means separate from the said first hydraulic pump means for supplying pressure fluid tending to move the brake against its resilient bias towards its released position to allow movement of the machine along said path, a second hydraulic control for controlling the supply of pressure fluid from said second hydraulic pump means to said brake, and means responsive to the operational condition of the machine's haulage mechanism to thereby actuate said second hydraulic control to block off the pressure fluid supply to cause application of said brake against said rail to prevent uncontrolled movement of the machine along said path.

4,045,084

IN-SITU MINING OF COPPER AND NICKEL

Limin Hsueh, Bedford; Robert A. Hard, Still River; Donald H. Davidson, Bedford, and Ray V. Huff, Acton, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,547

Int. Cl.[2] E21B *43/28*

U.S. Cl. 299—4 11 Claims

1. A process for the in-situ mining of metal values selected from copper, nickel or mixtures thereof from a subterranean ore body characterized by natural microscopic fracture openings, a portion of said body being a sulfidic ore, said process being characterized by the steps of:

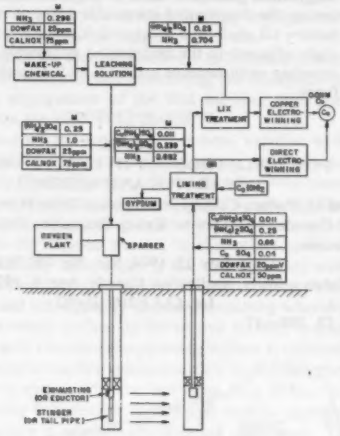
a. drilling at least one injection hole and at least one production hole communicating with said ore body;

b. forming a stable, two-phase lixiviant comprising an aqueous phase,

a multiplicity of gaseous, oxygen containing bubbles having a size, when subjected to the pressure employed during in-situ maining, sufficient to pass through the fracture openings in said ore body, and

a surfactant for maintaining the size and individuality of said bubbles;

c. forcing the lixiviant formed in step (b), under pressure, through said ore body to cause the lixiviant to penetrate the ore body through the natural microscopic fracture openings, the oxygen in said lixiviant reacting with the sulfide in the ore to enable metal ions to be solubilized by said aqueous phase;



d. withdrawing the resultant metal bearing aqueous phase to the surface through said production hole; and

e. recovering metal values from said aqueous phase.

4,045,085

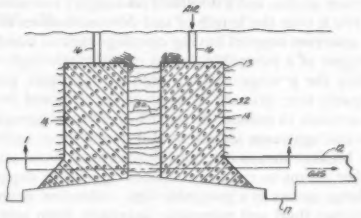
FRACTURING OF PILLARS FOR ENHANCING RECOVERY OF OIL FROM IN SITU OIL SHALE RETORT

Donald E. Garrett, Claremont, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Apr. 14, 1975, Ser. No. 567,509

Int. Cl.[2] E21C *41/10, 43/00*

U.S. Cl. 299—2 26 Claims



1. A method for recovery of shale oil from a fragmented permeable mass of particles in an in situ oil shale retort in a subterranean formation containing oil shale and from fractured unfragmented formation containing oil shale adjacent the fragmented permeable mass, said retort having pillars of a first portion of unfragmented formation defining boundaries for the fragmented permeable mass of particles, said fragmented permeable mass being obtained by fragmenting part of a second portion of the formation within such boundaries, comprising the steps of:

fracturing unfragmented formation containing oil shale in the first portion and adjacent the second portion;

excavating a part of the second portion of the formation to form at least one void and leaving a remaining unfragmented part of said second portion extending away from such an excavated void, the excavated void volume being in the range of from about 10 to 25 percent of the volume of the fragmented permeable mass being formed;

explosively expanding said remaining part of said second portion toward such an excavated void for forming the fragmented permeable mass of particles; and

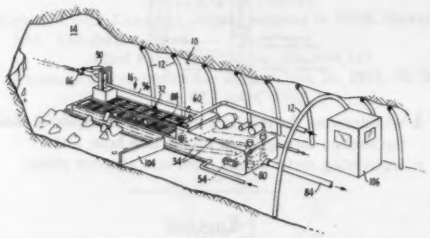
retorting the fragmented permeable mass of particles containing oil shale and fractured formation containing oil shale adjacent to the fragmented permeable mass for recovering carbonaceous products including shale oil therefrom.

4,045,086

PUMPABLE PRODUCT HYDRAULIC MINING APPARATUS AND METHOD

David M. Parkes, Calgary, and Thomas Brian Hart, Fernie, both of Canada, assignors to Kaiser Resources Ltd., Vancouver, Canada

Filed July 22, 1976, Ser. No. 707,701
Claims priority, application Canada, Apr. 6, 1976, 249699
Int. Cl.[2] E21C *25/60*
U.S. Cl. 299—17 **12 Claims**



9. An hydraulic mining apparatus comprising, in combination: a perforate continuous loop belt conveyor having upstream and downstream sections and a reach extending over the length of said sections, the belt of said conveyor being sufficiently open to permit the substantially unrestricted passage of mined aggregate therethrough and having an upstream support extending beneath said reach over the length of said upstream section and a downstream support extending beneath said reach over the length of said downstream section, at least said upstream support having openings therein sized to permit aggregate of a pumpable size to pass therethrough while preventing the passage therethrough of aggregate greater than pumpable size; primary breaker means disposed intermediate said sections to reduce the size of oversized aggregate passing from said upstream section to said downstream section; secondary breaker means disposed downstream from said primary breaker means to reduce oversized aggregate departing from the latter means to a pumpable size; collection means disposed to receive fluid and pumpable aggregate from said conveyor and secondary breaker means; and, pump means communicating with said collection means to withdraw and pump fluid and aggregate therefrom and convey the same under pressure.

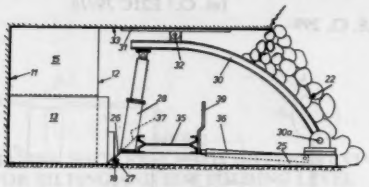
4,045,087

MINING APPARATUS

Cecil Vowe Peake, 2424 Blake Court, Bethlehem, Pa. 18017

Filed Sept. 8, 1975, Ser. No. 611,409
Claims priority, application United Kingdom, Sept. 7, 1974, 39148/74
Int. Cl.[2] E21D *15/502*
U.S. Cl. 299—31 **6 Claims**

1. Longwall mining apparatus comprising a mineral cutting machine arranged to traverse back and forth along a mineral face; and a plurality of self-advanceable roof supports arranged side by side along said mineral face, each of said supports comprising a base having a flat top portion adapted to support a face conveyor, said base having a front end and a rear end, an inclined plate-like shield having a lower end and an upper end, at least one substantially upright hydraulic prop adapted to be extended and retracted and mounted on the base adjacent said front end of the latter, first hinge means connecting said lower end of said shield to said base and second meas connecting said upper end of said shield to the upper end of said hydraulic prop, a roof support platen connected to said shield upwardly spaced therefrom, an extendable and retractable advance hydraulic cylinder mounted on said base and connected to said face conveyor, said face conveyor being located between said



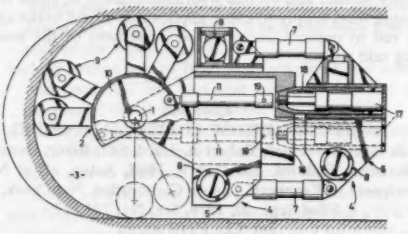
hydraulic prop and said hydraulic cylinder, guide means located on the face side of said hydraulic prop and adapted to guide a mineral cutting machine in its traverse along said mineral face, a ramp plate on said front end of said base adapted to scoop cut mineral onto said flat top portion of said base as said roof support is advanced towards said mineral face relative to said conveyor by operation of said hydraulic cylinder.

4,045,088

OSCILLATING DISK THIN SEAM MINING MACHINE WITH STEERING

Karl-Gunther Bechem, Hagen-Berchum, Germany, assignor to Hannelore Bechem and Ingrid Binnewies, both of Hagen, Germany

Filed Apr. 13, 1976, Ser. No. 676,420
Claims priority, application South Africa, Apr. 17, 1975, 75/2446; Sept. 29, 1975, 75/6187; Sept. 29, 1975, 75/6189
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—31 **14 Claims**



1. A mining machine having a drilling head and a carrier, means pivotally mounting said head to the forward end of said carrier; fluid operated means for arcuately reciprocating said drilling head about said pivot means; said carrier having a first portion and a second portion, said portions being laterally pivotable with respect to each other about a veratical axis which is capable of limited travel both lengthwise and laterally of said machine; a pair of laterally spaced hydraulic props mounted on one of said portions, one of said props being on each side of the longitudinal centerline of said machine, each of said props having extensible legs extending both above and below said carrier to provide floor and roof engagement; at least one hydraulic prop mounted on the second of said portions and having extensible legs extending both above and below said carrier to provide floor and roof engagement; a pair of extensible and retractable cylinders interconnecting said first and second portions, said cylinders being independently operable to pivot said portions with respect to each other and

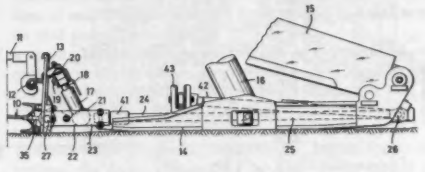
about one of said props by extension or retraction of said cylinders to enable said machine to execute a turn of 90° substantially about its midpoint.

4,045,089

APPARATUS FOR CONTROLLING THE POSITION OF A MINING MACHINE

Alois Hauschopp; Horst Schlusener, both of Werne, and Christoph Rassmann, Lunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed July 26, 1976, Ser. No. 708,368
Claims priority, application Germany, July 31, 1975, 2534325
Int. Cl.[2] E21C *27/32*
U.S. Cl. 299—43 **12 Claims**



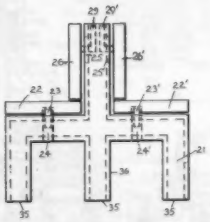
1. Apparatus for controlling the position of a mineral mining machine movable along guide means; said apparatus comprising beams pivotably connected to the guide means with connecting means and pivotably and displaceably connected with a support structure, at least one piston and cylinder unit operable to adjust the angle between the guide means and the beams, the unit being connected to the connecting means with a ball-and-socket type joint at a position disposed outwardly from the pivot axis between the guide means and the beams with the unit in an inclined disposition.

4,045,090

EASY-TO-ASSEMBLE STRUCTURE

William F. Fleisch, 126 Campbell Ave., Williston Park, N.Y. 11596, and Walter Pousche, 58-05 Metropolitan Ave., Brooklyn, N.Y. 11237

Continuation-in-part of Ser. No. 264,207, June 19, 1972, Pat. No. 3,845,988. This application Nov. 1, 1974, Ser. No. 520,441
Int. Cl.[2] A47C *7/00*
U.S. Cl. 297—440 **27 Claims**



1. An assembled structure comprising:

a supporting device containing therein wall means which defines and elongated slot system and having a first supporting surface and a second supporting surface in angular relation with the first supporting surface;

a first structural member having a first contact surface engageable with the first supporting surface;

a second structural member having a second contact surface engageable with the second supporting surface so as to be adjacent to, and disposed in angular relation with, the first member;

a connecting means for connecting a selected portion on the first member to an adjacent portion on the second member; and

locking means comprising a hook system securing the first member in gravity-controlled, locking engagement with the slot system on the supporting device;

the location of the second member in its intended position on the assembled structure preventing the disruption of the locking engagement of the first member with the slot system on the supporting device;

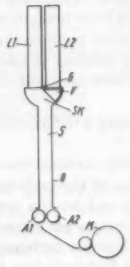
the first and second structural members, together with the supporting device and the connecting means being so relatively dimensioned as to have therebetween operating clearances so substantial that upon the selected portion on the first member being connected by the connecting means to the adjacent portion on the second member and simultaneously upon aligning the locking means with the slot system, the hook system is insertible into the slot system and subsequently slidable therealong whereby the second contact surface on the second member is made to engage with the second supporting surface at substantially the same time the first contact surface on the first member is made to engage with the first supporting surface so that the locking engagement is achieved and the assembly of the structure is substantially instantly completed.

4,045,091

DEVICE FOR THE PNEUMATIC FEEDING OF A QUANTITY OF CARDS

Wolfgang Beneke, 4072 Wickrathberg, Gudderather Weg 28, Germany

Continuation of Ser. No. 591,692, June 30, 1975, abandoned, which is a continuation of Ser. No. 391,766, Aug. 27, 1973, abandoned. This application Mar. 16, 1976, Ser. No. 667,383
Claims priority, application Germany, Aug. 26, 1972, 2242038
Int. Cl.[2] B65G *53/60*
U.S. Cl. 302—28 **1 Claim**



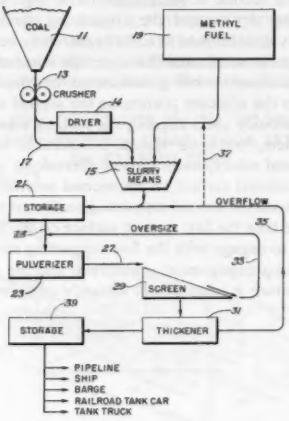
1. A device for pneumatic feeding of fiber flocks to a series of cards, each of said cards being fed by means of a deposit chute, at least two pneumatic lines having ends for feeding fiber flock selectively communicating with said deposit chutes, means disposed at the inlet of each of said deposit chutes to selectively connect or disconnect each said deposit chute to one of said pneumatic lines without interfering with flock flow through said lines to other deposit chutes whereby flock passing through any of said pneumatic lines may be simultaneously fed to one or more of said cards said means disposed at the inlet of each deposit chute consists of a flap pivotally movable to permit flock flow from one of said lines into said chute and to block flow from the other of said lines into said same chute.

4,045,092

FUEL COMPOSITION AND METHOD OF MANUFACTURE

Leonard J. Keller, Dallas, Tex., assignor to The Keller Corporation, Dallas, Tex.

Filed Sept. 22, 1975, Ser. No. 615,697
Int. Cl.[2] B65G 53/30; C10L 1/32
U.S. Cl. 302—66 13 Claims



1. A fuel composition comprising a combustible, pseudo-thixotropic liquid-solid suspensoid including a critical proportion of combustible carbonaceous particles having a critical settling velocity substantially uniformly dispersed in a solution of methyl fuel including methanol, water and other alcohol soluble constituents of said carbonaceous particles; said carbonaceous particles being present in a proportion of 50–80 percent by weight; said carbonaceous particles being sized and shaped to have a settling velocity in water of less than 2½ centimeters per second and worked in the presence of said methanol so as to be wet by said methanol along all surfaces; said carbonaceous particles being held in suspension in said liquid-solid suspensoid by even low intensity stirring in storage and not separating out when pumped through a pipe line; said suspensoid having shear thinning rheological properties so as to be pumpable with a lower apparent viscosity than its at-rest viscosity.

8. A method of preparing a fuel composition comprising the steps of:

a. preparing combustible carbonaceous particles of −8 mesh sizes with a majority of the carbonaceous particles being of −100 mesh size and having settling velocities of no more than 2½ centimeters per second in water;

b. working said combustible carbonaceous particles in the presence of methyl fuel including methanol so as to dissolve water and other alcohol-soluble impurities therefrom and activate and wet the surfaces of said combustible carbonaceous particles; and

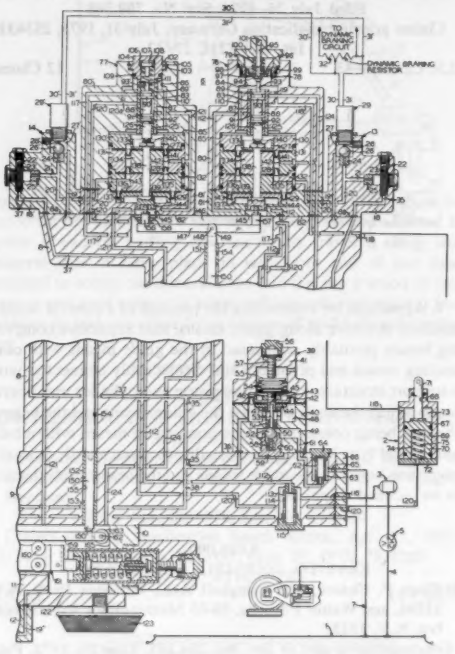
c. preparing a combustible, pseudo-thixotropic liquid-solid suspensoid having said worked combustible carbonaceous particles that have been worked to dissolve the alcohol-soluble impurities therefrom substantially uniformly distributed in the methyl fuel solution containing the alcohol soluble impurities dissolved from said combustible carbonaceous particles; said suspensoid including 50–80 percent by weight of said worked combustible carbonaceous particles and having shear thinning rheological properties so as to be pumpable with a lower apparent viscosity than its at-rest viscosity.

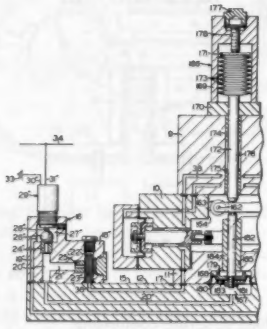
4,045,093

DYNAMIC BLENDING WITH A SPRING-APPLIED FLUID PRESSURE RELEASED SERVICE BRAKE INCLUDING COJOINT SPRING AND FLUID PRESSURE EMERGENCY FEATURE

Robert J. Bridigum, Plum Borough, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 11, 1976, Ser. No. 740,836
Int. Cl.[2] B60T 13/74
U.S. Cl. 303—3 26 Claims





sion of said spring and thereby a release of a service brake application, and a second position in which it prevents said flow and effects a release of fluid under pressure from said other side to atmosphere to enable said spring to effect a service brake application,

d. a second valve means having one position in which fluid under pressure is released from said one side of said piston, and a second position in which fluid under pressure flows from said source of fluid under pressure to said one side whereby the fluid pressure force established thereby on said one side acting cojointly with said spring effects an emergency brake application in the absence of fluid under pressure on the other side,

e. means so interlocking said first and second valve means as to prevent operation of said second valve means from its said one position to its said second position prior to operation of said first valve means from its said one position to its said second position,

f. a spring-biased mechanical linkage so cooperating with said interlocking means as to enable said linkage to transmit sufficient force to effect successive shifting of said first and second valve means from their said one to their said second positions, and

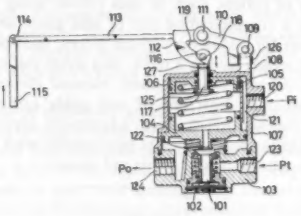
g. operator-controlled electro-pneumatic means for so controlling the force transmitted by said spring-biased mechanical linkage as to effect operation of only said first valve means or successively said first and said second valve means.

4,045,094

RELAY VALVE COMBINED WITH A LOAD-SENSING PROPORTION VALVE

Itiro Yanagawa, and Isao Suzuki, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 469,008, May 10, 1974, Pat. No. 3,936,097.
This application Oct. 10, 1975, Ser. No. 621,594
Claims priority, application Japan, May 30, 1973, 48-60555; May 30, 1973, 48-60556
Int. Cl.[2] B60T *8/22*
U.S. Cl. 303—22 R **8 Claims**



1. A combined load-sensing proportion and relay valve for an air brake system in a vehicle comprising:

a valve body having an inlet port connected to an air source and an outlet port connected to a brake actuator and an internal chamber, said body including a passageway extending from said inlet port and through said chamber to said outlet port;

said valve body having an axial center hole as exhaust passage;

a valve disk mounted within part of said exhaust passage and being interposed in said passageway and cooperating with a valve seat formed on said body for opening said passageway to provide communication between said inlet and outlet port, and closing said passageway to provide communication between said outlet port and said exhaust passage;

a control inlet port for supplying a control pressure from a brake valve to said valve body;

a control piston unit mounted coaxially with said valve disk within said valve body, said unit being responsive to said control pressure applied through said control unit port, said control piston unit including a first pressure sensing piston for directly governing the opening and closing of said valve disk, a second pressure sensing piston coaxially connected and resiliently coupled by a spring with said first pressure sensing piston;

a rod mounted for axial movement disposed in an upper portion of said valve body, said rod having a stopper element at one end for limiting axial movement of the second control piston;

a bracket being disposed on said upper portion of said valve body;

a linkage mounted for movement with respect to said bracket, said linkage being movable responsive to a payload of the vehicle in an axial valve direction; and

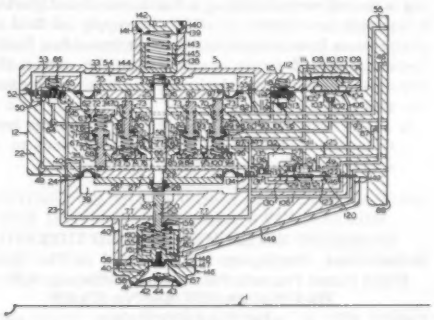
a control cam forming part of said linkage, said cam cooperating with said rod, said cam having an actuating cam face portion for moving the rod over a first vertical distance during normal load conditions and an idle cam face portion for moving the rod over a second vertical distance which is relatively smaller than said first distance corresponding to movement of a suspension spring of the vehicle outside of a normal spring deflection range whereby said valve will continue to operate regardless of any deflection of the vehicle spring outside said normal deflection range.

4,045,095

EMERGENCY PORTION FOR BRAKE CONTROL VALVE

Fred Temple, Swissvale, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 25, 1976, Ser. No. 699,624
Int. Cl.[2] B60T *15/44*
U.S. Cl. 303—37 **4 Claims**



1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure-operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application and comprising:

a. a casing having therein a plurality of chambers, bores and passageways, one of said bores and one of said passageways cooperating to provide a communication through which fluid under pressure may be released from another chamber other than said plurality of chambers to atmosphere via one of said plurality of chambers, said one bore having at one end an annular valve seat, and one end of said passageways opening into said chambers and bores and the other end being connected respectively to the

brake pipe, the emergency reservoir and said another chamber,

b. a plurality of poppet-type valves for controlling flow between said chambers and passageways, a first one of said poppet-type valves cooperating with said annular valve seat to control flow between said another chamber and said one of said plurality of chambers,

c. movable abutment means subject respectively to pressure in the brake pipe and in said another chamber, the deflection of said abutment means in one direction responsive to a reduction of the pressure in the brake pipe being effective to cause said abutment means to operate said first one of said plurality of poppet-type valves to release fluid under pressure from said another chamber to atmosphere and a second one of said poppet-type valves to effect the supply of fluid under pressure from the emergency reservoir to the brake cylinder, and the deflection of said abutment means in an opposite direction responsive to a subsequent increase of the pressure in the brake pipe being effective to cause said abutment means to operate a third one of said poppet-type valves to effect the supply of fluid under pressure from the brake cylinder to the brake pipe,

d. resilient means effective to yieldingly resist deflection of said abutment means in said opposite direction, said resilient means being effective to subsequently deflect said abutment means in said one direction responsive to the pressure in said another chamber increasing to that in the brake pipe,

e. a first means enabling said first one of said plurality of poppet-type valves to release fluid under pressure from said another chamber to atmosphere at a chosen rate in response to the release of fluid under pressure from the brake pipe at said chosen rate,

f. a first fluid-pressure-operated means for rendering said first enabling means ineffective to release fluid under pressure from said another chamber at said chosen rate,

g. a second means enabling a fourth one of said plurality of poppet-type valves to effect the supply of fluid under pressure from said another chamber to said first fluid-pressure-operated means in response to the release of fluid under pressure from the brake pipe at a rate in excess of said chosen rate, and

h. a third means enabling the release of fluid under pressure from said first fluid-pressure-operated means to atmosphere at a rate different than said chosen rate.

4,045,096

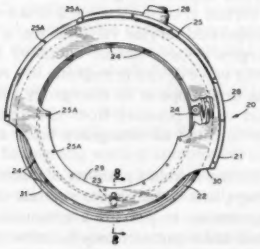
SPOKELESS WHEEL AND SHROUD THEREFOR

Arthur Lidov, Poughquag, N.Y., assignor to The Spokeless Wheel Patent Proceeds Partnership, Poughquag, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,620

Int. Cl.[2] B62D *55/00*

U.S. Cl. 305—7 **16 Claims**



15. A rotor and supporting shroud comprising means defining a rotor shroud,

an annular rotor disposed within said shroud for rotation relative to said shroud,

a plurality of centering bearings circumferentially spaced within said shroud,

said centering bearings acting on said rotor with a lateral bias to confine said rotor to a vertical plane of rotation within said shroud,

said centering bearings comprising rollers disposed on opposite sides of said rotor and disposed in rolling engagement with said rotor,

a plurality of circumferentially spaced load sustaining roller bearings for retaining said rotor within said shroud,

means for resiliently mounting each of said load sustaining roller bearings to said shroud whereby said resiliently mounted bearings absorb the impact forces imparted to said rotor as said rotor rolls over the ground,

said roller bearings being circumferentially spaced about said shroud and rotor disposed therein so as to be disposed on opposite sides of said rotor.

4,045,097

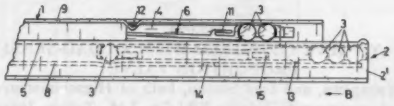
PULL-OUT GUIDE

Erich Röck, Kuferstrasse 1085, A-6973 Hochst, Germany, and Bernhard Mages, Hartle 10, A-6850 Dornburn, Austria

Filed June 8, 1976, Ser. No. 693,908

Int. Cl.[2] F16C *29/02*

U.S. Cl. 308—3.8 **6 Claims**



1. A pull-out for external sides, for use in a fixed structure having two internal sides comprising:

support rail means placeable on each of the fixed structure sides for supporting the drawer;

guide rail means disposed on the external sides of the drawer;

a plurality of rollers, each of said rollers being supported between a corresponding one of said guide and support rail means for taking up vertical forces, each of said support rail means having a track, said guide rail means having a front end, an adjustment element disposed at the front end of at least one of said guide rail means and resting on said track, said adjustment element being wedge-shaped and vertically positionable with respect to said at least one of said guide rail means.

4,045,098

FLUID BEARING

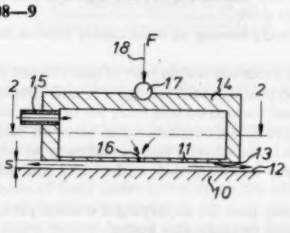
Eric Jozef Blondeel, Brugge, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Oct. 6, 1975, Ser. No. 619,967

Claims priority, application United Kingdom, Aug. 10, 1974, 43554/74

Int. Cl.[2] F16C *17/16*

U.S. Cl. 308—9 **28 Claims**



1. A fluid-static bearing for supporting a load transmitting object wherein a surface of the bearing and a surface of a

portion of said load transmitting object together define a bearing gap and wherein one of said surfaces is compliant and comprises a fluid inlet zone connected with an external supply of pressurized fluid at a substantially constant pressure for introduction of such fluid at a substantially constant pressure through said inlet opening into said bearing gap so that said fluid under pressure can flow along said gap from said inlet zone to one or more fluid outlet zones located at an outer extremity of said bearing gap, so that at any bearing load within a certain range the said gap will exhibit, where load supporting reaction forces occur, convergence in the direction of fluid flow, and any increase in such load within the said range will cause a relative displacement of said sufaces involving an increase in said convergence.

4,045,099

ROTOR FOR A TURBO-MACHINE

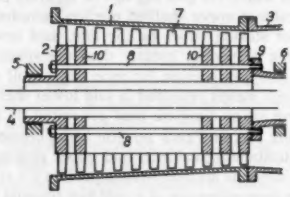
Lars Andersson, Hudiksvall; Johnny Rehn, Malmo, and Ragnar Torstenfelt, Finspong, all of Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden

Filed Feb. 19, 1976, Ser. No. 659,293

Claims priority, application Sweden, Feb. 21, 1975, 7501949

Int. Cl.[2] F16C *32/00*

U.S. Cl. 308—36 **3 Claims**



1. In a rotor for a turbine machine of the axial flow type having a plurality of axially spaced discs for mounting turbine blades and interleaved spacing rings all held in abutting relationship for rotation as a unit by a plurality of circularly disposed through bolts and with each face of each of said spacing rings defining thereon an annular shoulder which mates with a cooperating annular shoulder on an opposing face of an adjacent disc to prevent relative radial movement among said assembled discs and spacing rings, the improvement comprising:

a portion of each said spacing ring extending radially inwardly of said annular shoulder and having a thickness in the axial direction less than the spacing between the opposing faces of the adjacent discs to thereby increase the strength of each said spacing ring but with a minimal increase on the stresses thereon resulting from high speed rotation.

4,045,100

CONCENTRIC ANTIFRICTION BEARING ASSEMBLY

Jean Beauchet, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

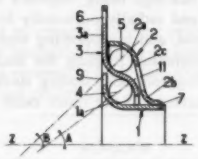
Continuation of Ser. No. 440,919, Feb. 8, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,389

Claims priority, application France, Feb. 14, 1973, 73.05238; May 16, 1973, 73.17798

Int. Cl.[2] F16C *19/16, 19/38, 33/34, 33/48*

U.S. Cl. 308—183 **16 Claims**

1. An antifriction bearing adapted to be mounted between two relatively rotatable mechanical members, said bearing comprising two annular rows of bearing elements mounted approximately in the same radial plane, an intermediate flange formed from a sheet metal material adapted to be secured to one of said mechanical members and providing an inner race for one of said two rows of bearing elements and an outer race for the other of said two rows, an inner and an outer flange formed from a metal sheet material and being adapted to be secured to the other of said mechanical members, each of said inner and outer flange providing another race one for each of said two rows of bearing elements, said inner flange having a surface inclined with respect to the rotational axis of the antifriction bearing to contact the bearing elements in the other of said rows at points which are closer to the bearing axis than are the centers of the bearing elements in the other of said rows, each bearing element in both of said rows of bearing elements contacting said flanges at points on a line which forms an acute angle with respect to the rotational axis of the antifriction bearing, one of said inner and outer flanges having an integrally formed annular portion in the form of a tubular sleeve concentric with the axis of the bearing and adapted to be directly fitted on a corresponding cylindrical part of said other mechanical member.



12. An antifriction bearing adapted to be mounted between two relatively rotatable mechanical member, said bearing comprising two annular rows of bearing elements mounted approximately in the same radial plane, an intermediate flange formed from a metal sheet material adapted to be secured to one of said mechanical members and providing an inner race for each of said two rows of bearing elements, an inner and an outer flange formed from a metal sheet material and being adapted to be secured to the other of said mechanical members, each of said inner and outer flange providing another race one for each of said two rows of bearing elements, at least one of said inner, outer and intermediate flange having an integrally formed annular portion in the form of a tubular sleeve concentric with the axis of the bearing and adapted to be directly fitted on a corresponding cylindrical part of said other mechanical member.

4,045,101

MOUNTING FOR MULTI-WORMS IN TRANSMISSIONS FOR DRIVING MULTI-WORM PRESSES FOR PROCESSING SYNTHETIC MATERIAL

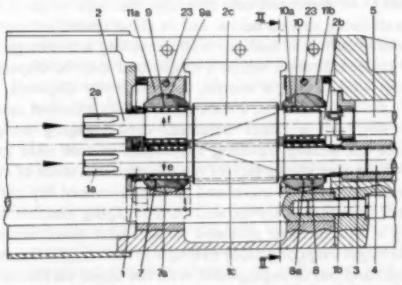
Heinrich Schafer, Vellmar, Germany, assignor to Rheinstahl Aktiengesellschaft, Essen, Germany

Filed Nov. 10, 1975, Ser. No. 630,133

Claims priority, application Germany, Nov. 13, 1974, 2453684

Int. Cl.[2] F16C *9/06*

U.S. Cl. 308—194 **5 Claims**



1. In combination with a transmission, especially for transmitting high torques during driving of a worm press indepen-

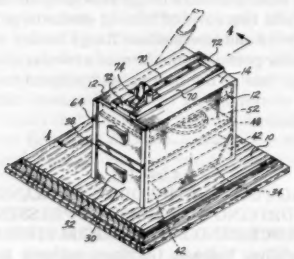
dently of forces exerted on shafts effective in radial direction being distributed uniformly upon adjoining rows of races of radial bearings used for processing synthetic material; a transmission housing, at least two shafts in said transmission housing in parallel spaced relation, a pair of axially spaced antifriction bearings for each shaft with the bearings for the respective shafts being coplanar, each bearing having an inner race on the respective shaft and an outer race over entire periphery thereof seated securely in said housing to assure necessary rigidity and rotary accuracy during high operational speeds and antifriction elements between and rollingly engaging the races, each outer race having the outer surface formed spherically, each adjacent pair of coplanar bearings having the adjacent sides of the outer races thereof formed with flat surfaces which are parallel to the axes of the shafts supported by the respective bearings, said flat surfaces on one side of the outer races of the pair of adjacent bearings being disposed in parallel spaced opposed relation and radially outwardly from the respective antifriction elements, and a supporting body in common and fixed in said transmission housing for each set of coplanar bearings and having spherical seating surfaces engaging the spherical outer surfaces of the outer races of the respective bearings.

4,045,102

CARD STORAGE AND DISPENSING DEVICE

Walter H. Austin, 2205 Harrison Ave., Everett, Wash. 98201

Filed Mar. 24, 1976, Ser. No. 669,830
Int. Cl.[2] A47F *01/12*; A45C *11/18*
U.S. Cl. 312—61 **8 Claims**



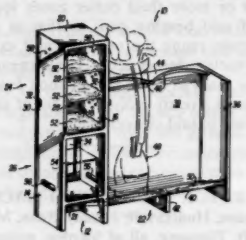
1. A card storage and dispensing device comprising a cabinet having vertically disposed side walls, a vertically disposed front wall, a vertically disposed rear wall, a horizontally disposed bottom wall means, and a horizontally disposed top wall, said walls forming a card enclosure for receiving a stack of cards to be dispensed, one at a time, the upper edge of said rear wall being spaced below and in close spaced relation to the bottom surfce of said top wall providing a discharge slot therebetween through which a single card may be dispensed, said top wall having a central, longitudinally disposed, dispenser guide slot therein; a slide guide means mounted on said guide slot; and a finger actuated, card-engaging member mounted for sliding traveling movement in said slide guide means to engage the surface of the top card of a stack of cards in one direction of its travel and to slide over said top card in its other direction of travel, said card-engaging member comprising a slide member mounted on said slide guide means, a tiltable finger-engaging piece having a lower end portion movable into and out of engagement with the upper surface of the topmost card of said stack of cards in said card enclosure, and pivot means carried by said slide member and positioned crosswise of the dispenser guide slot.

4,045,103

GOLF EQUIPMENT STORAGE DEVICE

Vincent J. Paolino, 2026 Sagamore Drive, Euclid, Ohio 44117

Filed June 30, 1976, Ser. No. 701,408
Int. Cl.[2] A47B *53/00, 81/00*
U.S. Cl. 312—198 **5 Claims**



1. A golf equipment storage device comprising, in combination, an upstanding cabinet having upper and lower shelved portions, a rack portion adjacent to said cabinet for receiving at least one golf bag therein in upright position, said rack portion including an upper retaining member and a lower shelf member upon which the golf bag can be securely position, said upstanding cabinet upper shelved portion includes a plurality of shelves for storing shoes or the like, said lower shelved portion having a spacing greater than the spacing between shelves in said upper portion for receiving a golf cart battery charger therein, means provided in said lower shelved portion for circulating air to dissipate heat generated by said battery charger during use, said rack portion being connected to one side of said upstanding cabinet, said upper retaining member including at least one arcuate-shaped portion for at least partly engaging the circumference of a golf bag situated in said rack portion, said lower shelf member being rearwardly inclined from a horizontal plane, said shelf member and the arcuate-shaped portions of said retaining member cooperating to prevent respective forward and sidewise toppling of a golf bag situated therein.

4,045,104

CABINET STRUCTURE AND METHOD OF CONSTRUCTION

Clinton B. Peterson, 3892 Jefferson Ave., Ogden, Utah 84403

Filed Aug. 20, 1975, Ser. No. 606,099
Int. Cl.[2] A47B *43/00*; A47F *5/14*
U.S. Cl. 312—257 R **6 Claims**

1. A cabinet structure comprising

a plurality of elongate frame members, the ends of which are hollowed out to define sockets, and at least certain ones of which include a hole in a side wall of each socket, and

a plurality of corner members for joining the ends of the frame members to form a cabinet structure, each of said corner members including

a central post adapted to slide longitudinally into the sockets of the frame members, and

a pair of legs extending substantially perpendicularly from one end of the central post at a predetermined angle with respect to each other, each leg having a rigid nipple protruding from one side of the leg opposite the side closest to the central post, with the other side of each leg being tapered such that the end of the leg is narrower than the base thereof to thereby enable slipping the leg into the sockets of the frame members so that the nipple of the leg is received into a hole of the sidewall of the sockets,

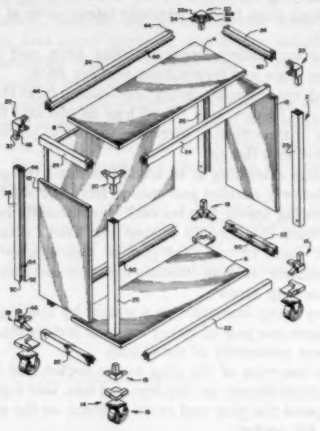
four of said frame members being arranged to form a lower rectangle,

four of said corner members being disposed at the corners of the rectangle, with the legs of each such corner members extending into corresponding contiguous sockets of the

frame members and the central posts of such corner members extending upwardly,

four other of said frame members being arranged to form an upper rectangle,

four other of said corner members being disposed at the corners of the upper rectangle, with the legs of each such corner members extending into corresponding contiguous



sockets of the upper frame members and the central posts of such corner members extending downwardly, and

four of said frame members being arranged to extend generally vertically between corresponding corners of the lower and upper rectangles, with the central posts of corresponding corner members extending into the sockets of the verticle frame members to thereby provide a unified cabinet frame.

4,045,105

INTERCONNECTED LEADLESS PACKAGE RECEPTACLE

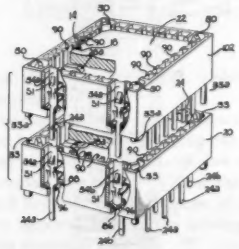
James C. K. Lee, and Charles Joseph Donaher, both of Los Altos Hills, Calif., assignors to Advanced Memory Systems, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 508,464, Sept. 23, 1974, Pat. No. 3,951,495. This application Mar. 17, 1975, Ser. No. 559,215

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.[2] H05K *1/12, 7/08*

U.S. Cl. 339—17 CF **18 Claims**



1. A chip carrier receptacle capable of being coupled to a second chip carrier receptacle, comprising:

a nonconductive receptacle body having a means for receiving a chip carrier assembly;

a plurality of spring contact members in said body, each of said contact members having a substantially straight portion thereof forming a terminal extending downward from said body, each of said contact members further having (i) a shaped cantilevered member extending toward the center of said body and disposed in said receptacle body so as to make a point contact with a conductive area on the bottom surface of said chip carrier assembly upon insertion thereof, each said cantilevered member having a projection with at least one component for engaging said conductive area on said chip carrier assembly, said contilevered member making an acute angle with respect to said conductive area such that when said chip carrier assembly is disposed in said receptacle, the end of each said cantilevered member slides across said conductive area and makes a point contact therewith, and (ii) an upright, elongated arm member, said arm member being a substantially vertical member disposed on each said spring contact member such that each lead extending downward from said second receptacle engages an associated arm member;

means on said receptacle body for releasably retaining said chip carrier assembly in said receptacle therein; and

means on said receptacle body for coupling said receptacle to said second receptacle.

4,045,106

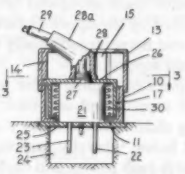
AUTOMATIC ELECTRICAL PLUG RELEASE

John P. Borg, 30 Fontenay Court No. 502, Islington, Ontario, Canada (M9A 4W5)

Filed Feb. 17, 1976, Ser. No. 658,510

Int. Cl.[2] H01R *13/62*

U.S. Cl. 339—45 R **4 Claims**



1. An automatic electric plug release comprising:

i. a hollow receptacle having a base portion with a substantially wide opening therethrough said base portion being seatable against the outer surface of an electrical wall socket and a top portion having at least two equally spaced lugs projecting inwardly from opposed portions on the inside wall thereof;

ii. a mounting member within the receptacle, said member having rotative, and up-and-down movement between a locked position and an unlocked position;

iii. an electrical plug mounted on the mounting member. and having its terminal prongs extendable through the opening in the base portion and an electrical cord connected of said prongs;

iv. a compression spring mounted in the receptacle between said mounting member and said base portion;

v. complemental ears on the mounting member engageable with said lugs when the mounting member is depressed and rotated in one direction whereby the mounting member and electrical plug are held in the locked position with the terminal prongs extending outwardly from the base; and

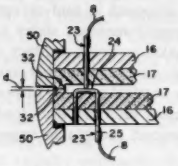
vi. an electrical cord sleeve mounted on the top of the electric plug and enclosing said cord, said electrical cord sleeve being inclined relative to the axis of rotation of the mounting member whereby on pulling on said cord the mounting member is rotated and released from the locked position and actuated to the unlocked position thereby withdrawing the prongs from the socket.

4,045,107

MULTI-CONTACT CONNECTORS WITH IDENTICAL CONTACTS

Byron Sutherland, Pearland, Tex., assignor to Walker-Hall-Sears, Inc., Houston, Tex.

Continuation of Ser. No. 606,902, Aug. 22, 1975, abandoned.
This application Nov. 26, 1976, Ser. No. 759,686
Int. Cl.[2] H01R *25/00*
U.S. Cl. 339—48 **2 Claims**



1. A two-plug connector for detachably connecting together two lengths of a multiple conductor cable, each connector plug comprising:

an insulating base, a protective housing supporting said base;

a support covering said base, said support being made of a flexible, insulating material of sufficient resiliency to tend to reassume its original form after deformation;

a plurality of U-shaped contacts, each contact having an elongated prong-end and a pair of prongs forming integral part with and extending from each prong-end, one prong of each pair of prongs being adapted for connected to a cable conductor, each prong-end lying on and being resiliently supported by the upper surface of said support, and each prong-end being urged axially away from the upper surface of said support;

a plurality of pairs of aligned holes transversely extending through said support and said base, each pair of contact prongs being slidably received by a corresponding pair of said aligned holes, whereby said support makes a water tight joint with each prong, and each prong-end is removable by pulling axially thereon away from the upper surface of said support; and

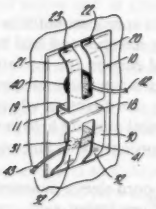
the housing of one connector plug being adapted to form a mechanical attachment with the protective housing of the other connector plug to thereby mechanically and electrically engage the respective prong-ends of both connector plugs at an angle relative to each other.

4,045,108

SPRING RETAINER FOR ELECTRIC PLUGS

Emil M. Olsen, 642 E. Webster Ave., Ferndale, Mich. 48220

Filed Jan. 31, 1977, Ser. No. 764,382
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 P **3 Claims**



1. A retainer to hold the plugs of electric cords in the dual sockets of electric power outlets with the outlets surrounded by a rectangular shield having opposite ends and sides and a centrally located attaching screw between the sockets, comprising,

a relatively narrow base plate for transversely overlying the shield between the sockets;

said base plate having a central aperture;

said base plate being attached to the outlet by removing the screw from the shield, inserting the screw in the aperture of said base plate, and returning the screw into attached position on the outlet to secure said base plate in a position overlying the shield on the outlet;

said base plate having opposite lateral sides at the dual outlets;

paired upstanding flanges leading from said sides on said base plate and terminating in outer ends;

paired, spaced-apart spring legs leading from the ends of said paired flanges; said paired legs on one said flange extending in the opposite direction from said paired legs on the other said flange;

said legs extending at an angle from said flanges so as to lie relatively parallel and spaced from the shield; and

depending spring feet on said legs normally lying in spring pressed relationship against the shield counterbalancing the force of one said pair of legs against the other to eliminate levering-twisting force on said base plate and the attaching screw;

a plug being insertable in a socket by leading the plug between one pair of spring legs and feet by manually flexing them outwardly of the shield;

upon insertion of the plug in the socket and the release of manual flexure on said legs and feet, said legs flexing back against the plug and exerting force on the plug to hold it in the socket;

the holding force of said legs against one inserted plug being counterbalanced by said other legs and feet bearing against the shield to eliminate levering-twisting force on said base plate and the attaching screw;

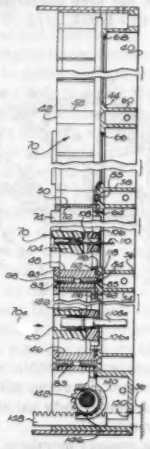
when two plugs are so inserted the spring force of each said pair of legs bearing against an inserted plug counterbalancing the other to eliminate levering-twisting force on said base plate and the attaching screw.

4,045,109

ELECTRONIC PACKAGING ASSEMBLY

Jack E. Langenbach, Newport Beach, and John L. Hawkins, Whittier, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,890
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—75 M **23 Claims**



1. An electronic packaging assembly comprising:

a generally flat stationary support having a front and a rear;

a box for containing electronic components slidable on the upper surface of said support from said front, said box having a front and a rear;

a first set of fixed contacts at said rear of said support;

a second set of movable contacts at said rear of said box, said first and second sets of contacts being positioned adjacent to but spaced from each other when said box is slid to said rear of said support;

means for moving said second set of movable contacts to engage said first set of contacts, said means including a movable actuating element on said front of said box, a contact actuating member at said rear of said box engaging said movable contacts and movable relative thereto, and motion transmitting means extending through said box from said front to said rear thereof for transmitting movement from said actuating element to said contact actuation member; and

said moving means also including a latching hook at said front of said box cooperating with said support to prevent lifting of said front of said box off of said support and prevent forward movement of said box on said support surface.

4,045,110

ELECTRICAL CONNECTOR HOUSINGS

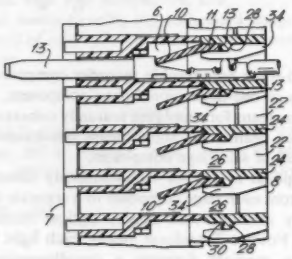
Cornelus Adrianus Henricus Maria Sterken, Eindhoven, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 28, 1976, Ser. No. 727,550

Claims priority, application United Kingdom, Oct. 4, 1975, 40727/75

Int. Cl.² H01R *9/16, 13/54*

U.S. Cl. 339—91 R **4 Claims**



1. An electrical connector housing for a plurality of electrical contacts comprising:

a. first and second housing parts of electrical insulating material and being adapted for mating one with the other, each housing part having at least one row of spaced parallel passageways, the passageways of the housing parts being aligned to define at least one row of cavities extending between opposed faces of the housings when mated for receiving electrical contacts;

b. a channel in the first housing part extending across the passageways;

c. an elongated strip of insulating material having a plurality of spaced apart lances projecting outward form one edge, said strip positioned in the channel with individual lances extending into the cavities in the row for resiliently engaging and retaining electrical contacts which may be inserted into the cavities.

4,045,111

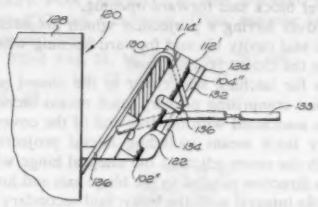
ELECTRICAL TERMINATION DEVICE AND METHOD

Carl W. Peterson, Westminster, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 4, 1976, Ser. No. 663,908

Int. Cl.² H01R *9/08*

U.S. Cl. 339—97 R **21 Claims**



16. A termination device for making electrical connection to an electrical conductor having a metallic core covered with insulation comprising:

an electrically conductive tubular member having longitudinally extending slots therein on generally opposite sides of said tubular member defining relatively closely spaced-apart core penetrating opposed edges and relatively further spaced-apart insulation penetrating edges, respectively;

said slots terminating in enlarged, generally aligned openings whereby the conductor may be inserted laterally into said tubular member through said enlarged openings and may be pulled at an angle into said slots to cause said insulation penetrating edges to penetrate the insulation of the conductor and said core penetrating edges to penetrate the core of the conductor; and

said tubular member having a longitudinal seam therein extending to the opposite ends thereof and passing through one of said slots.

4,045,112

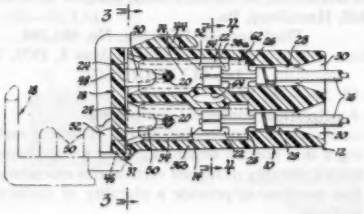
UNITARY INSULATOR HOUSING WITH SECONDARY LATCH MEANS AND ELECTRICAL CONNECTOR UTILIZING SAME

Andrew F. Rodondi, Sharpsville, Pa., and Martin H. Hommer, Cortland, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1976, Ser. No. 673,710

Int. Cl.² H01R *9/08*

U.S. Cl. 339—99 R **8 Claims**



1. A unitary molded housing of electrically insulative material comprising:

a body of generally rectangular cross section having a longitudinally extending open ended terminal receiving cavity,

said cavity having a rearward opening for a first lead wire to extend through,

and a forward opening for receiving a second lead wire to position the same in the cavity,

said body having a longitudinal slot through a forward

portion of a top wall which communicates with the forward opening and forward portions of the cavity,

a cover connected by an integral hinge to a forward end of said body and moveable upon bending of the integral hinge about a hinge axis transverse to the longitudinally extending open ended terminal receiving cavity from an open position whereat said forward opening is freely accessible to a closed position whereat portions of said cover block said forward opening,

said cover having a projection which projects rearwardly into said cavity via said forward opening when the cover is in the closed position, and

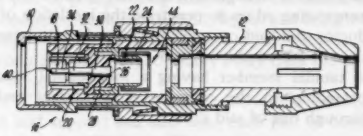
means for latching said cover in the closed position, said means comprising primary latch means including a latch arm associated with the free end of the cover and secondary latch means including lateral projections integral with the cover adjacent the integral hinge which project in a direction parallel to the hinge axis and hooks axis and hooks integral with the body, said secondary latch means in cooperation with said primary latch means retaining the cover in the closed position in the event the hinge fractures.

4,045,113

CONNECTOR SAFETY TIP

Frederick Della Iacono, Crestwood, N.Y., assignor to Kings Electronics Company, Inc., Tuckahoe, N.Y.

Filed June 28, 1976, Ser. No. 700,381
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—111 **6 Claims**



1. A connector having a male center conductor, a grounding contact surrounding said male center conductor and spaced therefrom and not contacting said male center conductor, an insulating tip on the end of said male center conductor for reducing the chance of finger contact between the male center conductor and the grounding contact.

4,045,114

METHOD OF MANUFACTURING AN ELECTRICAL CONNECTOR

Helen Dechelette, St. Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

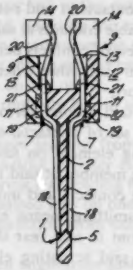
Filed Apr. 28, 1976, Ser. No. 681,294
Claims priority, application France, May 5, 1975, 75.13936
Int. Cl.[2] H01R *13/50*
U.S. Cl. 339—210 M **3 Claims**

1. An electrical connector comprising:

a. an elongated first housing part of insulating material having a thin portion depending from a cup shaped portion with a plurality of spaced vertical ribs extending along the two portions to provide a plurality of distinct coplanar surfaces;

b. a plurality of conductive contacts having a first elongated part and a second part with a transition part connecting the first and second parts, said first part positioned on a coplanar surface on the thin portion and the second part positioned over and extending above the cup shaped portion, and the transition part positioned over the junction of the thin portion and cup shaped portion; and

c. two second housing parts each having an elongated portion with a plurality of upstanding spaced walls across the upper section thereof, said second housing parts secured to either side of the cup shaped portion on the first housing part so that the upstanding walls are positioned on top of the cup shaped portion and the lower section presses in



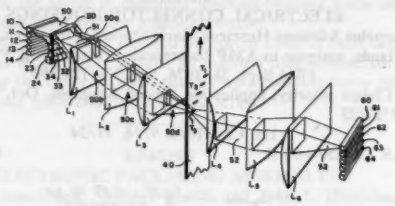
on the lower half of the second part of the contacts to thereby provide a bias against the contacts to hold the first parts thereof against the coplanar surfaces of the housing.

4,045,115

OPTICS FOR MULTI-TRACK HOLOGRAPHIC TAPE RECORDER

Tzuo-Chang Lee, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 17, 1975, Ser. No. 632,338
Int. Cl.[2] G03H *1/16*
U.S. Cl. 350—3.5 **11 Claims**



1. A multi-track holographic recorder comprising:

a plurality of one-dimensional page composers;

light beam means for supplying mutually coherent signal and reference beams, and signal beam simultaneously illuminating all of said page composers;

passive optical means for simultaneously directing a light beam from each page composer to a separate location at a memory medium, said passive optical means including optical Fourier Transform means, each light beam at the memory medium forming a one-dimensional Fourier Transform of the information in the page composer and each Fourier Transform interferring with the mutually coherent reference beam to form a one-dimensional hologram.

4,045,116

WIDE ANGLE OPTICAL IMAGING SYSTEM

Joseph A. La Russa, 451 Rutledge Drive, Yorktown Heights, N.Y. 10598

Filed Feb. 27, 1975, Ser. No. 553,870
Int. Cl.[2] G02B *13/06*
U.S. Cl. 350—21 **9 Claims**

1. Optical imaging apparatus for viewing two- or three-dimensional models and remotely imaging the view comprising

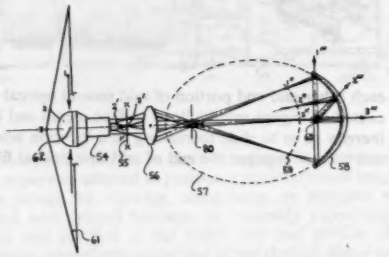
i. image producing means;

ii. wide angle objective lens means for viewing the image producing means through approximately a field of view in the range of 90°–220°, 360° in azimuth about the optical

axis of said objective lens means, said objective lens means producing a distorted aerial image, commonly referred to as fisheye distortion, at the focal plane thereof;

iii. relay lens means adapted to reproduce the distorted aerial image from the objective lens means focal plane in a second aerial focal plane;

iv. concave reflector means generally ellipsoidal and of an eccentricity such that the pupil of said relay lens means and the pupil of said reflector means are both at the foci of said reflector means which are positioned beyond said second aerial focal plane, said reflector being of such a size and shape that all of the principal rays from all image points in the distorted aerial image produced by the wide angle objective lens means and corresponding divergent rays from image points in the second aerial focal plane



which reproduces the distorted aerial image are redirected and the divergent rays are approximately collimated towards the pupil of said reflector means thereby forming an optically accessible pupil conjugate to the pupil of the objective lens means which produces an approximately collimated image which corresponds to the entire field of view of the objective lens means in true angles, free from distortion which permits, in effect, viewing the external world from the pupil of the objective lens means which is totally inaccessible and which is the only point through which the external world can be viewed without distortion and with true perspective; and

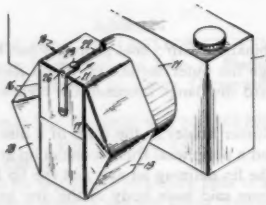
v. optical means to relay the collimated image produced at the pupil of said reflector means to an accessible viewing location.

4,045,117

COMBINED CAMERA LENS CAP AND LENS SHADE

Jack Lerner, 337 W. 71st St., New York, N.Y. 10023

Filed Apr. 23, 1976, Ser. No. 679,561
Int. Cl.² G03B *11/04*
U.S. Cl. 350—60 **4 Claims**



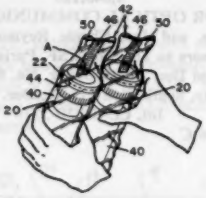
1. A combined camera lens cap and lens shade comprising a hollow housing open at each end for attachment to a camera lens, a plurality of flaps hingedly secured to the periphery of the housing opposite the camera lens receiving end thereof, said flaps being interconnected along their adjacent margins by fold lines and swingable from a closed position overlying the end of the housing to which they are secured to an open position substantially coaxial with the said housing end, said flaps being of a size which will cover the housing end to which they are attached when in the closed position and means operatively coupled to at least one of the flaps comprising an elongated groove in the housing, a strip of flexible material secured at one end to said flap and slidably received at its other end within the groove to actuate the said flaps.

4,045,118

DRAPE FOR OPERATING MICROSCOPE

James Leonard Geraci, Cincinnati, Ohio, assignor to Xomed, Inc., Cincinnati, Ohio

Filed Aug. 21, 1972, Ser. No. 282,409
Int. Cl.² G02B *23/16*
U.S. Cl. 350—61 **3 Claims**



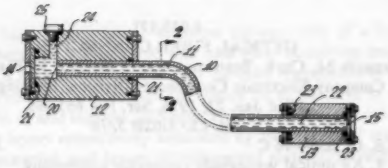
1. A drape for enclosing an operating microscope having an objective lens and an elongate ocular which terminates in a free outer end, said drape including an elongate, tubular portion dimensioned to loosely receive the ocular of the microscope, the free outer end of said tubular portion including a centrally disposed, elongate, partially closed, flattened area defining a pull tab portion, a circumferential tear line in said tubular portion spaced inwardly from the innermost end of said pull tab portion, wherein the relationship between the innermost end of the pull tab portion and said circumferential tear line are such that said tear line will be disposed closely adjacent the free outer end of the ocular when the ocular has been introduced into said tubular portion to the extent permitted by interference between the free outer end of the ocular with the constricted interior of the ocular housing adjacent the lower end of said pull tab.

4,045,119

FLEXIBLE LASER WAVEGUIDE

Harold F. Eastgate, Auckland, New Zealand, assignor to Laser Bioapplications, Los Angeles, Calif.

Continuation-in-part of Ser. No. 498,063, Aug. 14, 1974, abandoned. This application June 13, 1975, Ser. No. 586,713
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 LM **7 Claims**



1. A flexible waveguide for the transmission of a high-power laser beam, comprising:

a flexible tube of a material transparent to light of the same wavelength as that of the beam;

a substantially compressible liquid core filling said tube, said liquid being also transparent to light at the same wavelength, having a refractive index substantially greater than that of the material of said tube and being retained in said tube in a compressed condition, with a volume substan-

tially less than its volume when subjected to normal atmospheric pressure; and

sealing means at each end of said tube, including an input window at one end and an output window at the other end for the transmission of the beam into and from said tube, respectively, and wherein at least one of said sealing means includes means for compressing said liquid core on assembly of said flexible waveguide;

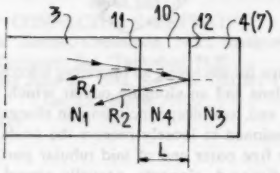
whereby the laser beam is transmissible around bends in said tube by multiple total internal reflections, to provide a portable source of laser energy at said output window, and said compressible liquid core is placed in said tube under pressure to prevent formation of cavities due to different rates of thermal expansion of said liquid and said tube.

4,045,120

COUPLER FOR OPTICAL COMMUNICATION SYSTEM

Guy de Corlieu, and Jean-Claude Reymond, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 19, 1975, Ser. No. 642,446
Claims priority, application France, Dec. 20, 1974, 74.42370
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C **10 Claims**



1. In an optical communication system having at least one signal transmission line comprising at least one optical waveguide having a core of transparent material having a refractive index N1 surrounded by a layer of transparent cladding material having a refractive index N2 that is lower than N1 and associated by each end to a solid state converter device for light emission and light reception respectively, said converter devices having refractive indices higher than the said core index, optical coupling means for coupling at least one said waveguide end to a said associated device through an optical coupler comprising at least one transparent matching medium having a refractive index N4 intermediate between the said core index N1 and the refractive index N3 of the associated device and forming a thin plate whose maximum thickness along the optical axis direction is given by the relation

$$LM = [(D1 + D2)/2] \cdot [(\sqrt{N4^2 - A^2})/A]$$

where A is the numerical aperture of the waveguide, i.e. $\sqrt{N1^2 - N2^2}$ and D1, D2, the diameters of the plane interfaces perpendicular to said axis direction and provided by the core at said waveguide end and the associated device respectively.

4,045,121

OPTICAL FIBER CONNECTOR

Kenneth M. Clark, Beaumont, Calif., assignor to The Deutsch Company Electronic Components Division, Banning, Calif.

Filed Jan. 22, 1976, Ser. No. 651,285
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C **33 Claims**

1. An optical waveguide connector comprising

a first element having an inclined surface means,

a second element,

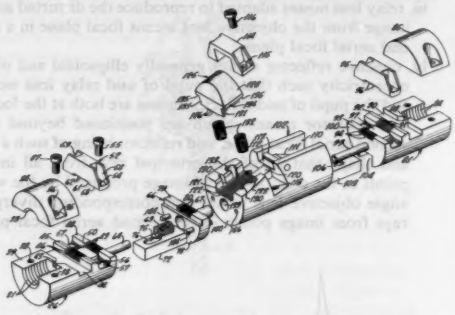
at least one first optical fiber having resilience,

means on said first element for holding said first optical fiber with an end portion thereof on said inclined surface means,

at least one second optical fiber having resilience,

means on said second element for holding said second optical fiber so as to have an outwardly facing end portion,

and means for aligning said first and second elements such that said end portion of said second optical fiber is at an angle to said inclined surface means and upon relative advancement of said first and second elements toward



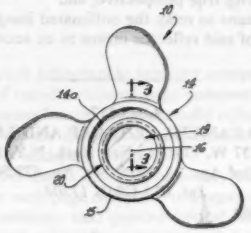
each other said end portion of said second optical fiber is caused to engage said inclined surface means and be bent thereby so as to slide therealong to a location where the end thereof engages the end of said first optical fiber.

4,045,122

PROPELLER HUB REFLECTOR HOLDER

Robert C. Burdick, 251 Avenida Santa Barbara, La Habra, Calif. 90631

Filed May 4, 1976, Ser. No. 683,100
Int. Cl.² G02B 5/12
U.S. Cl. 350—97 **5 Claims**



1. In combination with a boat propeller hub having a frusto-conical flange the outer surface of which flares axially rearwardly toward the flange terminal, the combination comprising

a. an elastomer holder in the form of a disc having a main body and a peripheral frusto-conical lip at one side of the body, the lip defining an axis and the lip tapering axially away from said main body of the disc to removably receive the hub flange periphery between the disc main body and the lip, and

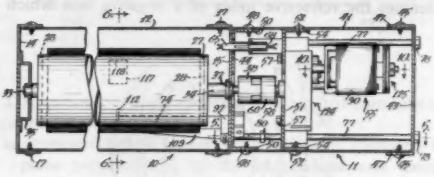
b. a light reflector carried by the main body of the holder and openly facing axially rearwardly away from the disc at the opposite side thereof, and to extend across the main extent of the area rearwardly subtended by the disc,

c. the hub and flange both being annular and the hub forming a central exhaust passage which is blocked by the holder and reflector.

4,045,123
CONTROL DEVICE TO POSITION PROJECTION SCREEN FOR VIEWING

Donald J. Brown, Naperville, Ill., assignor to Knox Manufacturing Co., Wood Dale, Ill.

Filed Jan. 9, 1976, Ser. No. 647,869
Int. Cl.[2] G03B 21/56
U.S. Cl. 350—117 10 Claims



1. A control device for an electric motor unit of a projection screen apparatus adapted to position a predetermined length of flexible screen for viewing, comprising: an elongate roller provided with spaced bearings for rotatably supporting the opposite end portions of the roller, one end portion of the roller being operatively connected to the electric motor unit to rotate the roller when the motor unit is actuated; means defining a depression in the lateral surface of the roller; support means for securing the bearings to a supporting surface; a flexible screen having a transverse marginal edge portion secured to said rotatable roller, said screen being wound upon said roller when in closed position and being unwound from said roller when in exposed viewing position, the screen having a cut-out portion affording an opening which exposes the depression in the roller when the screen is in viewing position; switch means movable between a non-conductive open condition and a closed condition making an electrical connection with the motor unit to rotate the roller and unwind the screen toward viewing position, the switch means being mounted adjacent the roller; and a movable member mounted adjacent the switch means and positioned to cooperate therewith to said switch means to move from closed condition to open condition, the movable member being normally urged toward the roller and having an end portion normally bearing against screen wound about the roller, the end portion being positioned to move tnrough the opening in the screen into the depression in the roller when the screen is in viewing position, the movement of said end portion causing the switch means to move from closed condition to open condition to electrically disconnect the motor unit and arrest rotation of the roller.

4,045,124
BISTABLE DEFLECTION SYSTEM

Joel M. Pollack, Rochester, and John B. Flannery, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

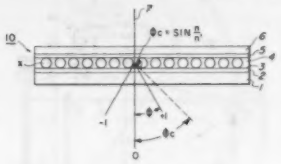
Filed Feb. 25, 1975, Ser. No. 552,898
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 8 Claims

1. A method for selectively reflecting light of a given wavelength, λ, within a layer of nematic liquid crystalline material, comprising:

a. providing, between two transparent electrodes, an about 1 micron to about 6 micron thick layer of homogeneously aligned nematic liquid crystalline material having negative dielectric anisotropy;

b. transmitting through at least one of said two electrodes light comprising said light of wavelength, λ; and

c. applying a d.c. voltage, between said two electrodes, at least at the parallel variable diffraction mode voltage threshold for said nematic liquid crystalline material wherein vortical domains of said liquid crystalline material are formed in a direction parallel to the direction of initial homogeneous alignment, said domains being substantially parallel one to the other and having a spatial frequency dependent upon the magnitude of said d.c.

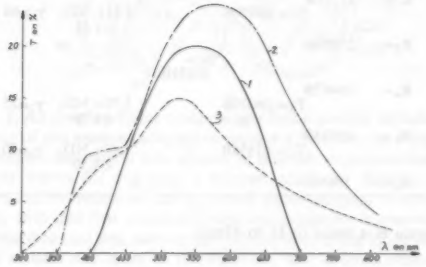


voltage, said d.c. voltage being above the critical angle voltage level for said light of wavelength, λ, wherein said spatial frequency is sufficient to totally internally reflect said light of wavelength, λ, within said layer of liquid crystalline material.

4,045,125
BAND FILTERS FOR USE IN PROTECTIVE GLASSES

Guy Farges, Paris, France, assignor to Etat Francias, Paris, France

Filed June 23, 1975, Ser. No. 589,511
Claims priority, application France, June 27, 1974, 74.22356
Int. Cl.[2] G02B 5/28
U.S. Cl. 350—166 12 Claims

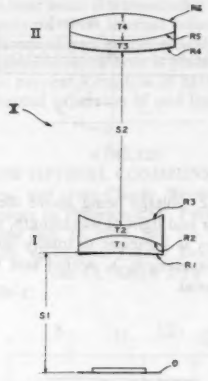


1. A band filter adapted to allow passage only of a band length between 350 and 750 nm, said filter consisting essentially of a support which is at least partially transparent in the considered band, a filter element coated on at least one of the two faces of said support, said filter element consisting of three metallic layers respectively separated by two layers of transparent material, said layers of transparent material having an index of refraction greater than 1.5, the optical thickness of the layers of transparent material each being equal to about ¼ of the mean wave length of the considered band, one of said metallic layers of said filter elements having a surface within about 15 nm of said support, and an anti-reflection coating on the outer surface of said filter element opposite said support, said anti-reflection coating consisting of a layer of a metallic or semi-metallic element on the other of said outer metal layers of said outer surface and a layer of transparent material disposed on said layer of metallic or semi-metallic element.

4,045,126
TWO-ELEMENT MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 24, 1976, Ser. No. 699,277
Int. Cl.[2] G02B 21/02
U.S. Cl. 350—175 ML 2 Claims



1. A microscope objective which has two elements aligned along an optical axis which comprises a biconcave negative doublet I and biconvex positive doublet II for the following optical parameters:

Lens	Radius(R)	Thickness(T)	Spacing (S)	Index of Refraction(ND)	No.(γ)
			S_1= .24167B		
	R_1=−4.36334B	T_1=.04651B		1.77<ND_1<1.79	γ_1≅25
I	R_2=− .25721B	T_2=.04070B		1.51<ND_2<1.53	γ_2≅64
	R_3= .27059B		S_2= .48271B		
	R_4= .96467B	T_3=.04070B		1.77<ND_3<1.79	γ_3≅25
II	R_5= .42024B	T_4=.07558B		1.48<ND_4<1.50	γ_4≅70
	R_6=− .39640B				

wherein B is equal to 41 to 45mm.

4,045,127
ENLARGING LENS SYSTEM

Masaki Matsubara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1975, Ser. No. 641,171
Claims priority, application Japan, Dec. 17, 1974, 49-144171
Int. Cl.[2] G02B 9/60
U.S. Cl. 350—210 6 Claims

1. An enlarging lens system comprising five components of seven lenses: a first positive meniscus lens component, a second positive meniscus lens component, a third lens component consisting of two lens elements, a fourth lens component consisting of two lens elements arranged after a stop and a fifth positive lens component, at least one of said third or fourth components including a positive lens, the concave face of which is adjacent and faced to said stop, and said enlarging lens system satisfying the following conditions:

$$n_b < n_a \quad (1)$$

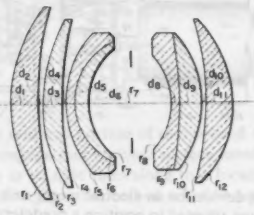
$$0.8f < f_e < 2.5f \quad (2)$$

$$0.04 < n_c - n_d < 0.12 \quad (3)$$

$$n_7 > 1.70,\ \nu_7 > 46 \quad (4)$$

$$0.6 < f_{II} / f_I < 1.6 \quad (5)$$

wherein the reference symbol n_a represents the refractive index of the positive lens which is comprised in the third or fourth component and is adjacent to said stop, the reference symbol n_b denotes the refractive index of a negative lens which is



cemented with said positive lens which is adjacent to said stop, reference symbol f_e designates the focal length of the cemented doublet which includes said positive lens which is adjacent to said stop, the reference symbols n_c and n_d represent refractive indices of the lens elements of the third or fourth components which includes a negative lens arranged on the side of said stop (n_c represents the refractive index of the lens element which is adjacent to said stop), the reference symbols n_7 and ν_7 denote the refractive index and Abbe's number of the fifth lens component, the reference symbols f_I and f_{II} denote the total focal lengths of the front and rear lens groups which are arranged before and after said stop respectively, and reference symbol f designates the focal length of the enlarging lens system as a whole.

4,045,128
TELEPHOTO OBJECTIVE

Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,958
Claims priority, application Japan, Apr. 25, 1974, 49-46920; June 28, 1974, 49-74168
Int. Cl.[2] G02B 9/60
U.S. Cl. 350—216 22 Claims

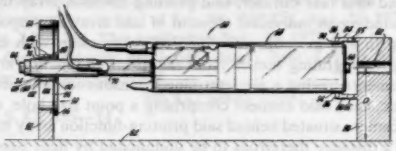
16. A telephoto objective of high speed adjustable focus comprising a front lens group which has a positive refracting power and remains stationary during focussing, and a rear lens group which is positioned on the image side axially apart from said front lens group and has a negative refracting power, said rear lens group being divided into two parts of which one part is axially movable to effect focussing to suit differing object distance, and the other part has a negative refracting power and stationary during focussing.

4,045,129

APPARATUS FOR HARD MOUNTING AN OPTICAL MEMBER TO A RIGID BASE

Martin R. Hamar, P.O. Box 31, Wilton, Conn. 06897

Filed Dec. 8, 1975, Ser. No. 638,506
Int. Cl.[2] G02B 7/00
U.S. Cl. 350—321 2 Claims



1. Apparatus for hard mounting an elongated laser tube to a rigid base structure comprising:

an elongated hollow member having bilateral symmetry in a plane perpendicular to the longitudinal axis thereof, which member terminates at one end with a base that is flexibly connected to said rigid base by means of a diaphragm assembly, said base having an aperture therethrough which is of greater diameter then the diameter of said laser tube whereby said base is concentric with said laser tube, the opposite end of said member engaging the laser tube and rigidly bonded thereto, said hollow member including a longitudinally-extending flexible wall having longitudinally-extending slits extending from said opposite end to points intermediate the length of the hollow member so as to define flexible spring fingers whereby when the base of the hollow member is secured to the rigid base at one end, it is concentric with a laser tube, and bonded to the laser tube at the opposite ends of said flexible fingers thereby providing an assembly that allows for differential thermal expansion of the elements of the assembly with minimum stresses being introduced into the laser tube while maintaining relative spacial alignment of the assembly.

4,045,130

APPARATUS FOR THE PERIMETRIC TESTING OF THE VISUAL FIELD OF THE HUMAN EYE

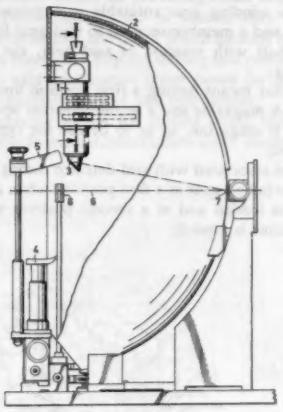
Wilhelm Krahn, Hamburg, Germany, assignor to Optische Werke G. Rodenstock, Germany

Filed June 9, 1975, Ser. No. 584,860
Claims priority, application Germany, June 12, 1974, 2428441
Int. Cl.[2] A61B 3/02
U.S. Cl. 351—24 20 Claims

1. An apparatus for perimetric testing of the field of vision of eyes comprising:

an approximately hemipherical shell; and

means for successively projecting selected individual ones of a plurality of patterns of light spots wherein each of said patterns comprise a plurality of light spots on the inner surface of said hemispherical shell at an angle corresponding to the visual field of the eye to be tested, said projecting means including means for controlling the light spots of each pattern as to brightness of position, size, and contrast with respect to the brightness of the inner surface of said hemispherical shell.

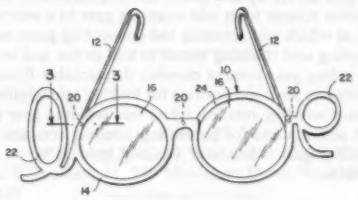


4,045,131

SPECTACLE FRAMES

Jack Sherman, 1 The Hollows, Syosset, N.Y. 11791

Filed Oct. 31, 1975, Ser. No. 627,540
Int. Cl.[2] G02C 11/02
U.S. Cl. 351—52 5 Claims



1. An eyeglass frame comprising a frame portion including a pair of rim sections adapted to receive a lens therein; a pair of temples, one lateral side of each of said rim sections including first means for engaging a lettered ornament thereon, said lettered ornament including second means adapted to cooperate with said first means whereby said ornament is removably affixed to said rim, each of said rim sections being in the shape of at least one letter of the alphabet, said lettered ornament depending from said rim sections in planar alignment therewith and extending across the face thereof thereby increasing the longitudinal breadth of said frame beyond that defined between said rim sections and said temples whereby said combination of said pair of rims and said ornamental letters forming a word.

4,045,132

FILM REWINDING DEVICE FOR MOVIE CAMERA

Yozo Iida, Komae, Japan, assignor to Nippon Kogaku, K.K., Tokyo, Japan

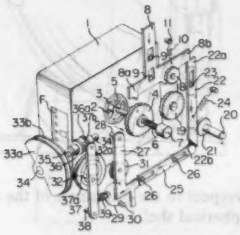
Filed Apr. 9, 1975, Ser. No. 566,305
Claims priority, application Japan, Apr. 15, 1974, 49-40918; May 2, 1974, 49-48748
Int. Cl.[2] G03B 21/36
U.S. Cl. 352—91 C 12 Claims

1. In a motor-driven motion-picture camera which is capable of selective use of both a type A magazine provided with a

non-releasable anti-backup device on an exposed film take-up shaft and a type B magazine provided with an externally releasable anti-backup device on said film take-up shaft, and which includes a winding gear rotatable in response to the motor operation and a member secured to said gear for rotating said take-up shaft with rotation of said gear, the improvements comprising:

a. detector means having a first position upon loading of a type A magazine and a second position upon loading of a type B magazine, so as to detect the type of magazine loaded;

b. means associated with said detector means for positioning said winding gear at a first position when a type A magazine is loaded and at a second position when a type B magazine is loaded;



c. means for disabling said anti-backup device for the type B magazine when this type of magazine is loaded;

d. means including a counting gear for counting the film footage of forward feed and reverse feed during overlap, double exposure and reverse photographing; and

e. manually displaceable control means including a connecting gear driven by said motor and displaceable from a first position remote from said counting gear to a second position at which said counting and connecting gears mesh for coupling said counting means to said motor and including a winding gear control member displaceable from a first position to a second position for locking said winding gear against winding rotation when said winding gear is at its first position and for permitting winding rotation of said winding gear when said winding gear is at its second position.

4,045,133

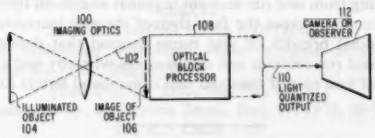
ANALOG OPTICAL BLOCK PROCESSOR

Curtis Raymond Carlson, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 13, 1975, Ser. No. 586,637

Int. Cl.[2] G03B *27/00*

U.S. Cl. 355—1 **3 Claims**



1. An analog optical processor for respectively quantizing the light of each elemental area of a light image manifesting pictorial information which is incident thereon, said analog optical processor comprising:

a. a plurality of contiguous light integrating tunnels, each of which has substantially the same cross sectional dimensions and a length which is long relative to the cross sectional dimensions thereof and wherein each respective tunnel has reflective sides,

b. a front diffuser covering the front surface of said plurality of contiguous light integrating tunnels through which said plurality of contiguous light integrating tunnels are illuminated by said incident light image,

c. a rear diffuser covering the back surface of said plurality of contiguous light integrating tunnels through which light emerging from each of said contiguous light integrating tunnels passes,

d. a printing-function array mask situated immediately behind said rear diffuser, said printing-function array mask including an individual element of said array corresponding to and in cooperative spaced relationship with each light integrating tunnel, all of said printing function array elements having a predetermined transmission characteristic, each said element comprising a point size hole, and

e. a camera situated behind said printing-function array mask at a distance therefrom to be illuminated by light passing through the respective elements of said printing-function array mask, and means including a single input aperture situated in front of said camera, said camera including a lens for imaging the light passing through said input aperture in an image plane, and said camera incorporating a recording medium situated in a given plane spaced from said image plane by a given distance to derive an individual blur image of said input aperture on said recording medium for the light from each respective element of said printing-function array mask.

4,045,134

PHOTOSENSITIVE MEMBER FOR USE IN ELECTROPHOTOGRAPHIC APPARATUS AND METHOD OF MANUFACTURING THE SAME

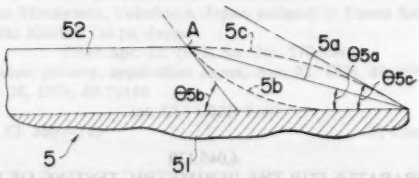
Shigeru Suzuki, Yokohama; Yasumori Nagahara, Yokosuka; Koji Sakamoto, Tokyo, and Katsuo Sakai, Machida, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 1, 1976, Ser. No. 662,723

Claims priority, application Japan, Mar. 5, 1975, 50-27530

Int. Cl.[2] G03G *15/00, 5/02*

U.S. Cl. 355—3 R **10 Claims**



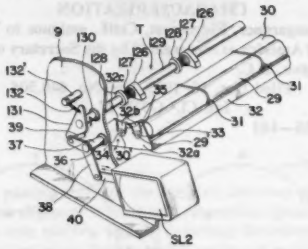
1. A photosensitive member for use in an electrophotographic apparatus which comprises means adjacent the surface of said member for appying a bias potential of the same polarity as an electrostatic latent image on said surface, toner being interposed between said means and said surface to develop said electrostatic image, said photosensitive member comprising a conductive support having a support surface with at least one support edge, and a photosensitive layer formed on said support surface and having an end extending up to a point substantially coincident with said support edge, the improvement comprising a tapered surface formed on said layer at said end extending from the top of said layer toward the support edge, the maximum angle between a tangent of said tapered surface and said support surface being less than 45°.

4,045,135

ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH RETRACTABLE IMAGE TRANSFER ROLLER MEANS

Yasuhiko Doi, Toyokawa; Shunji Yamamoto, Shinshiro; Osamu Okada, Toyokawa; Takashi Hikosaka, Atsumi, and Masamichi Hayashi, Minami Shidara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 500,171, Aug. 23, 1974, Pat. No. 3,997,262. This application Sept. 10, 1975, Ser. No. 611,874
Claims priority, application Japan, Sept. 7, 1973, 48-101372; Apr. 30, 1975, 50-52826
Int. Cl.² G03G *15/00*
U.S. Cl. 355—11 **3 Claims**



1. An electrophotographic copying apparatus of the electrostatic latent image transfer type, said apparatus comprising:

a reciprocatingly movable platform on which an original to be copied is placed;

a rotatable photoreceptor drum disposed below said platform and having a photosensitive surface onto which an image of the original is projected;

means disposed around said drum and including a corona charging means fopr applying charges uniformly onto said drum, an exposure slit means through which an image of the original is projected so as to form an electrostatic latent image on said photosensitive surface, an image transfer means for transferring the thus formed latent image onto a copying paper sheet, a separating means for separating said copying paper sheet from said drum, and an erasing means for erasing residual charges from said drum;

a paper feeding means for feeding a copying paper sheet along a path to said image transfer means;

a developing means for developing the copying paper sheet;

a fixing means for fixing the thus developed image;

means for detecting the arrival of a copying paper sheet at a predetermined location along said path;

shifting means for shifting said image transfer means between a first position in which said image transfer means is out of contact with said drum and a second position in which said image transfer means is in contact with said drum;

control means, actuatable by said detection means, for operating said shifting means for shifting said image transfer means from said first to second positions thereof; and

locking means normally preventing said platform from movement, and actuatable by said detecting means to release said platform and allow movement thereof.

4,045,136

CONTROL SYSTEM FOR PHOTOGRAPHIC FILM PRINTERS

Charles J. Watson, Elgin, and Larry L. Langrehr, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

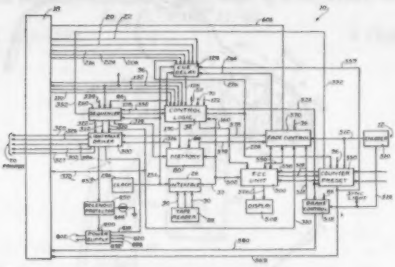
Filed Aug. 15, 1975, Ser. No. 605,008
Int. Cl.² G03B *27/78*
U.S. Cl. 355—83 **31 Claims**

1. A control system for controlling the operation of a photographic film printer which includes variable control means for printing a preprint film onto raw stock, comprising:

information input means for providing either first data comprising control information or second data comprising control information and cuing frame address information;

control data memory means for storing said control information from said information input means for conditioning variable control means of said film printer;

cue data memory means for storing cuing frame address information from said information input means;



discriminating means for determining whether said information input means has provided said first or second data and for conditioning said control system in accordance therewith; and

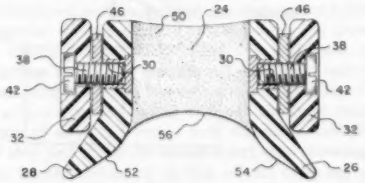
enabling means providing an output command signal at a predetermined position of said preprint film in the printer to selectively enable actuation of said variable control means in accordance with control information stored in said control data memory means.

4,045,137

OPHTHALMIC DEVICE AND METHOD

James B. Bradley, Jr., 110 Monteleon Drive, West Monroe, La. 71291

Filed Nov. 21, 1974, Ser. No. 525,842
Int. Cl.² G02C *5/04, 5/12*
U.S. Cl. 351—132 **6 Claims**



1. A removable nose piece attachment for an opthalmic eyeglass fitting frame comprising:

a. a generally inverted one piece rigid preformed U-shaped member formed with an upstanding portion thereon;

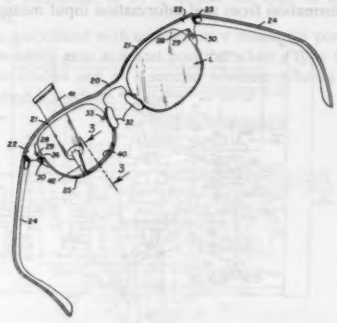
b. said U-shaped portion being sized in conform to a person's nose; and

c. said upstanding portion having imbedded therein female receptacles for locking said nosepiece to said fitting frame to thereby prevent rotation of the nosepiece; said female receptacles having means formed thereon to prevent their rotation within the nosepiece and having formed therein an internal thread for receiving a mating male screw.

4,045,138
METHOD FOR APPLYING A LIQUID FILLER TO LENSES IN GLASSES FRAMES

Donald M. Kunde, and Frank M. Lagrimanta, both of Lakewood, Colo., assignors to Prado Verde, Inc., Santa Fe, N. Mex.

Filed June 4, 1975, Ser. No. 583,597
Int. Cl.[2] G02C *13/00*
U.S. Cl. 351—178 4 Claims

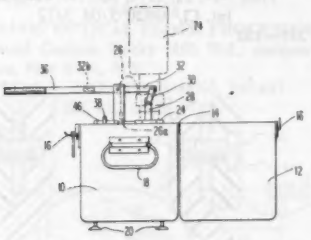


1. A method for installing a lens in a channel of an expansible eye wire rim of a glasses frame, said lens being ground to approximate the shape of said eye wire rim, comprising:
   a. applying to said channel of said eye wire rim a bead of cellulose acetate butyrate cut to a viscous liquid by methylene chloride capable of changing to a resilient, solid state after the expiration of a short time period;
   b. placing said lens in said eye wire rim while the rim is expanded to receive the same; and
   c. closing the eye wire rim upon the lens and resilient resin.

4,045,139
COMPACT PORTABLE CONTAMINATED FUEL DETECTOR WITH HAND-OPERATED PUMP

Daniel G. Russ, Fort Wayne, Ind., assignor to Telectro-Mek, Inc., Fort Wayne, Ind.

Filed Mar. 29, 1976, Ser. No. 671,309
Int. Cl.[2] G01N *1/00, 15/00*
U.S. Cl. 356—36 4 Claims

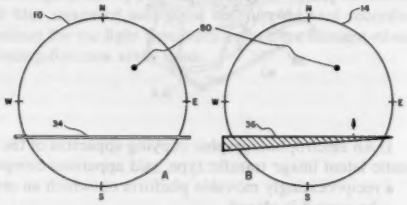


1. In a portable contaminated fuel detector comprising at least sample holder means, fuel filter means in a filter retainer, a vacuum receptacle arranged in series with means causing said parts to seal together upon drawing a vacuum to accelerate flow of fuel through the filter means into the vacuum receptacle and vacuum pump means for said purpose connected by a vacuum line to said vacuum receptacle, the improvement comprising
   a box enclosure including a top and a bottom, a deck supported on said bottom for supporting, in turn, a photocell system, a meter coupled thereto, the vacuum chamber and vacuum pump, the vacuum pump being a hand-operated vacuum pump such that no electric power is needed to operate the vacuum pump including a vertically oriented cylinder parallel to and adjacent to the vacuum receptacle and containing a vertically-movable piston with sealing means between the cylinder and the edge of the piston and check valves between the vacuum chamber and pump preventing air return to the vacuum chamber and at the outlet preventing air return to the pump and an axially arranged piston rod, the deck supporting removable pieces such as the filter retainer and sample holder, the top cover enclosing parts projecting above the deck.

4,045,140
MEANS FOR NEAR REAL TIME C-W LASER SOURCE CHARACTERIZATION

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1975, Ser. No. 640,504
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—141 6 Claims



1. A system for locating the source of radiation incident on said system, comprising:
   optical means for presenting two images of the field-of-view of said system:
   detecting means optically cooperating with said optical means for providing an electrical output indicative of each image;
   two optical modulation filters having finite lengths and attenuation factors, each filter movable across one of said images for occupying a portion of the optical path between the image and said detection means and wherein the attenuation factor of the filter moving across one of said images is invariant in a direction perpendicular to its movement, and the attenuation factor of the filter moving across the other image varies linearly in a direction perpendicular to its movement;
   circuit means electrically connected to said detection means for comparing the amplitudes of the outputs said detecting means associated with each of said images with one another; and
   means for sensing the position of at least one of said plurality of optical filters and providing an electrical analog of said position at the time of the comparison performed by said circuit means, whereby said position corresponds to the point of origin of said radiation within said field-of-view in at least one dimension.

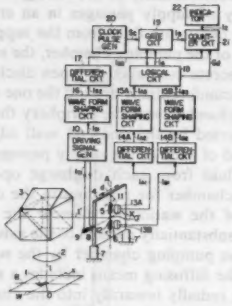
4,045,141
PHOTOELECTRIC MICROSCOPE

Shigeo Moriyama, and Yoshio Kawamura, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed June 14, 1976, Ser. No. 695,556
Claims priority, application Japan, June 13, 1975, 50-71500; Apr. 2, 1976, 51-36003
Int. Cl.[2] G01B *9/04*
U.S. Cl. 356—156 12 Claims

11. A method of positioning a test piece having a reference line thereon, comprising the steps of forming a magnified real

image of the reference line of said test piece and a point-symmetric image thereof on an identical focal plane by means of an objective and an optical system for making point-symmetric images as disposed in an optical path of said objective, passing the lights of the respective images through two openings provided in a slit plate for scanning said focal plane, introducing



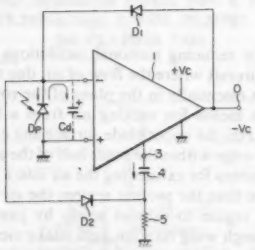
the lights passing through the slit plate into two photoelectric transducers disposed behind said respective openings, to convert them into electric signals, detecting the amount of deviation of said test piece from a central optic axis as determined by said objective and said optical system for making point-symmetric images from the relation of the time difference between the generation of said two electric signals.

4,045,142

METERING DEVICE FOR CAMERAS

Sakuji Watanabe, Yono, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 29, 1976, Ser. No. 681,506
Claims priority, application Japan, May 16, 1975, 50-57435
Int. Cl.[2] G01J 1/42; G03B 7/08, 7/00
U.S. Cl. 356—223 **2 Claims**



1. In a metering device comprising an operational amplifier, a photodiode connected between the positive and the negative input terminal of said operational amplifier, and a logarithmic conversion diode connected between the negative input terminal and the output terminal of said operational amplifier, the improvement comprising:

a terminal provided on said operational amplifier for producing an output synchronous with the output potential thereof;

means connected to said terminal and constituting a charging circuit when the output of said operational amplifier is within the range of metering potential and a short circuit when the output of said operational amplifier is below the range of metering potential; and

means connected between the junction between said charging circuit and said negative input terminal of said operational amplifier;

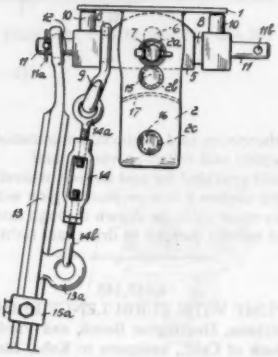
whereby the charge stored in the capacity present in said photodiode due to noise may be discharged through said second mentioned means to said charging circuit thereby to correct the photoresponsive characteristic of said metering device.

4,045,143

SWIVEL HITCH STRUCTURE

Valeriano Gomiero, Via Serravalle, 19, Fossona di Cervarese (Prov. Padova), Italy

Filed Aug. 29, 1975, Ser. No. 609,126
Claims priority, application Italy, Sept. 2, 1974, 41667/74
Int. Cl.[2] F16C 11/00
U.S. Cl. 403—102 **4 Claims**



1. A hitch structure for connecting agricultural implements or the like to pulling machines, comprising, at least one draw bar member connected to a frame of a pulling machine, said draw bar member extending in a longitudinal direction of the pulling machine, a cross-bar member extending transverse to said draw bar member, a swivel connection means between said draw bar and cross-bar members allowing swivelling movement of said cross-bar member with respect to said draw bar member about an upright axis substantially perpendicular to said longitudinal direction, wherein according to the improvement said swivel connection means comprise a slotted hole in one of said draw bar and cross-bar member, said slotted hole having its longitudinal extension parallel to said longitudinal direction, a pin member inserted in said slotted hole and connected to that other one of said draw bar and cross-bar members without said slotted hole, said pin member defining said swivel axis and being shiftable within said slotted hole from a forward end position thereof to a rearward end position thereof together with said one of said draw bar and cross-bar members, abutment means cooperating with said frame of the pulling machine and facing opposite end portions of said cross-bar member, stop means on the opposite end portions of said cross-bar selectively cooperating with said abutment means in one position of said pin member with respect to said slotted hole, said stop and abutment means selectively allowing and preventing limited swivelling motion of said cross-bar about said pin member and lever and link members for connecting said cross-bar member with said agricultural implement.

4,045,144

WIND ENERGY CONCENTRATORS

John Lodewyk Loth, P.O. Box 4094, Mogantown, W. Va. 26505

Filed Feb. 18, 1975, Ser. No. 550,841
Int. Cl.[2] F03D 1/04
U.S. Cl. 415—1 **12 Claims**

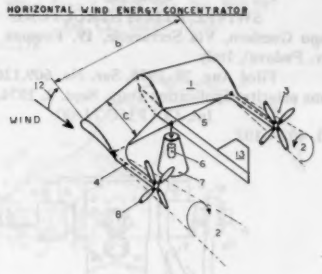
1. A wind energy concentrator, comprising:

a. an airfoil for generating a trailing vortex system, said airfoil being constructed to concentrate a substantial portion of the rotational energy of said trailing vortex system

into a rolled-up vortex at a predetermined spanwise location along said airfoil;

b. a turbine disposed outside said rolled-up vortex;

c. a duct means for providing fluidic communication between said turbine and said rolled-up vortex to extract



power therefrom, said fluidic communication being established within said rolled-up vortex; and

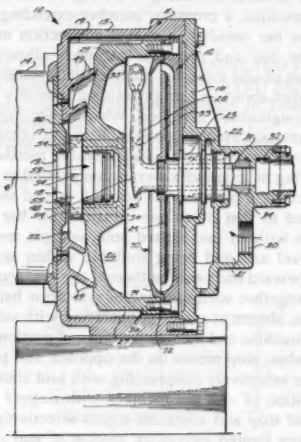
d. an air inlet provided for said turbine, whereby said rolled-up vortex creates a low pressure region within said duct means to cause air to be drawn through said air inlet and past said turbine thereby to drive said turbine.

4,045,145

PITOT PUMP WITH TURBULENCE ELIMINATION

John W. Erickson, Huntington Beach, and Vitolis Budrys, La Mirada, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed Dec. 19, 1975, Ser. No. 642,326
Int. Cl.[2] F04D *1/14*
U.S. Cl. 415—89 **3 Claims**



1. A pitot pump including:

a. a rotary casing mounted for rotation in a selected direction about an axis and having a pumping chamber therein;

b. a pumped fluid discharge duct coaxial with the casing;

c. a stationary element extending radially of said axis in the casing to an outer end thereof disposed toward the inner surface of the casing at the outer periphery of the pumping chamber, the element defining a pitot tube extending radially of the axis and having adjacent its outer end an inlet facing in a direction opposite to the direction of rotation of the casing for gathering from the chamber fluid to be pumped, the pitot tube having a passage connected to the inlet and extending generally in the direction of the casing rotation and toward the axis to an outlet connected to the discharge duct for discharging to the outlet duct fluid gathered from the chamber by the pitot tube inlet; and

d. delivery means for delivering fluid to be pumped to the pumping chamber proximately of the outer periphery thereof, the delivery means including:

1. a supply duct coaxially of the casing,

2. a plurality of supply passages in an end wall of the casing for delivering fluid from the supply duct to the periphery of the pumping chamber, the supply passages having discrete continuously open discharge openings spaced circumferentially around the one end wall of the pumping chamber near the periphery thereof, and

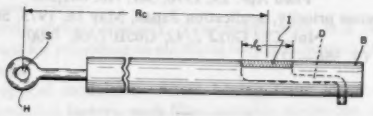
3. means carried by the one end wall adjacent the discharge end of each of the supply passages for diffusing flow of fluid from each discharge opening into the pumping chamber for reducing in the chamber in the vicinity of the stationary element the velocity, in a direction substantially parallel to the axis, of fluid delivered to the pumping chamber by the supply passages, wherein the diffusing means includes a shroud member extending radially inwardly into the chamber between the stationary element and the outlet ends of the supply passages for diverting the flow of fluid out of the passages into the chamber in a direction toward the axis of rotation of the casing.

4,045,146

HELICOPTER ROTOR BLADE

Peter Crimi, West Boxford, Mass., assignor to Avco Corporation, Wilmington, Mass.

Filed May 17, 1976, Ser. No. 687,359
Int. Cl.[2] B64C *27/46*
U.S. Cl. 416—1 **10 Claims**



1. Means for reducing torsional oscillations of a blade of a rotary wing aircraft where the flow of air, due to the motion of the aircraft, is essentially in the plane of the rotary wing comprising intake means for sucking air from a boundary layer region located on the upper blade surface and essentially solely at the leading edge within the outer half of the span of the wing and exhaust means for exhausting the air into a region of lower static pressure than the suction region, the air being removed from suction region to exhaust solely by passing centrifugal pumping through wing rotation, said intake means being solely in the 80–90% of maximum wing radius region.

4,045,147

TILTABLE WIND MACHINE FOR USE ON VARIABLE TERRAIN

Russell W. Curp, Newhall, Calif., assignor to SSP Agricultural Equipment, Inc., Visalia, Calif.

Filed May 10, 1976, Ser. No. 684,550
Int. Cl.[2] F04D *29/32*
U.S. Cl. 416—100 **12 Claims**

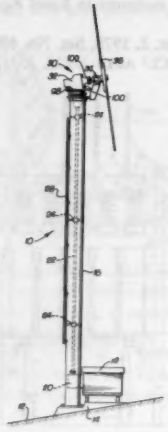
1. In a rotatable and variably tiltable wind machine for protection of agricultural growth, the wind machine being adapted for installation on a selected terrain having a varying surface contour 360° or less around the machine,

mounting means for securing the machine on the terrain,

a fan drive assembly mounted for rotation on and with respect to said mounting means, said rotation being about a generally vertical axis of the mounting means,

the fan drive assembly including a fan, a fan housing, and a fan shaft,

drive means associated with the mounting means to rotate the fan and the fan drive assembly, the rotation of the fan being on an axis generally transverse to said vertical axis, the improvement comprising:



tilting means associated with the mounting means and the fan for variably tilting the fan with respect to said fan housing and the terrain while the fan drive assembly is being rotated, and

means forming a part of said fan shaft to permit the fan to be tilted with respect to the housing.

4,045,148

TURBINE

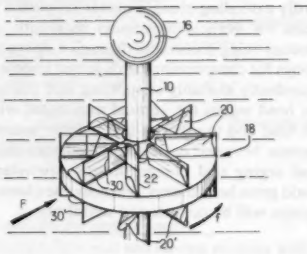
Bernard Morin, 1, rue Corneille, 78130 Les Mureaux, France

Filed Nov. 4, 1975, Ser. No. 628,650

Claims priority, application France, Nov. 4, 1974, 74.36632; Aug. 6, 1975, 75.24566; Sept. 1, 1975, 75.26787

Int. Cl.[2] F03B *7/00*

U.S. Cl. 416—84 **10 Claims**



1. A turbine with a current motor adapted to be immersed in water, said turbine comprising:

a disc having a density near that of the water in which it is immersed in horizontal attitude, said disc having cells containing a mixture of liquid and gas, said disc having upper and lower surfaces,

means resting on the bottom of the body of water and supporting said disc for rotation,

at least two blades respectively articulated to the upper and lower surfaces of the disc for pivotal movement about horizontal axes,

said blades having at least one pocket containing a mixture of gas and of a liquid such that the density of the blades articulated to the upper surface of the disc is less than that of water and the density of the blades articulated to the lower surface of the disc is greater than that of water,

means for locking the blades in one direction of pivotal movement when the blades reach a vertical position, and

at least one electrical generator means driven by rotation of said disc.

4,045,149

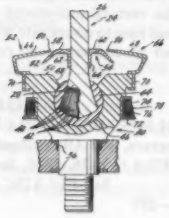
PLATFORM FOR A SWING ROOT TURBOMACHINERY BLADE

Richard Ravenhall, Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 3, 1976, Ser. No. 654,787

Int. Cl.[2] F01D *5/30*

U.S. Cl. 416—135 **13 Claims**



1. A rotor apparatus comprising:

a blade having a root portion and an airfoil portion;

means for supporting said blade including a groove curved in a generally circular concave profile to receive the blade root, the blade root conforming partially to the same profile, such that the blade is permitted to rotate laterally within the groove;

an inner flow path shroud extending generally laterally of the blade airfoil portion and laterally rotatable therewith; and

an outer flow path shroud nonrotatable with respect to said supporting means and in general alignment with the inner flow path shroud when the blade is in an unrotated position; wherein

said inner and outer shrouds are provided with a pair of complementary adjacent surfaces contoured to pass in relatively close-fitting relationship to each other when said blade is rotated laterally.

4,045,150

TIRE UPPER-BEAD POSITIONING DEVICE FOR USE IN A CURING PRESS

Georges Gazuit, Montlucon, France, assignor to Zelant, Gazuit, Montlucon, France

Filed Oct. 28, 1976, Ser. No. 736,311

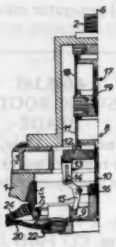
Claims priority, application France, Oct. 29, 1975, 75.33047

Int. Cl.[2] B29H *5/02*

U.S. Cl. 425—58 **6 Claims**

1. Device for centering and positioning the upper bead of a horizontally disposed crude tire around a bead ring disposed centrally of a vertically movable upper portion of a mold in a vulcanizing press of the type comprising a set of segments regularly angularly disposed around a vertical axis of symmetry of the mold in a central cavity in the upper mold portion, each segment being movable both vertically and radially under control of an actuator common to all the segments of the set, and an inflatable vulcanizing bladder disposed centrally of a lower fixed portion of the mold wherein said segments have their outer ends shaped to form a tapered centering surface having a taper directed downwardly and radially inwardly

with its axis merging with the vertical axis of symmetry of the mold, said actuator having a place connected thereto to extend radially of the axis of symmetry with said segments mounted thereon and located in a first position to be remotely below



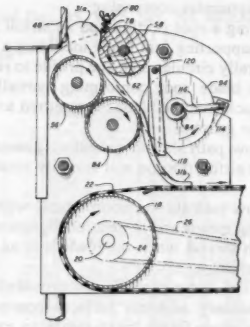
said bead ring and in abutment with an outer edge of the upper bead of the crude tire, said segments being movable to a second position by the vertical movement to be closely adjacent and below said bead ring to cooperate with said bladder for guiding the upper bead around said bead ring.

4,045,151

DOUGH FORMING AND CUTTING MACHINE

Joseph R. Zazzara, 302 Albert Road, Syracuse, N.Y. 13214

Filed Feb. 26, 1976, Ser. No. 661,724
Int. Cl.[2] A21C *11/12*
U.S. Cl. 425—297 **9 Claims**



1. Apparatus for shaping and severing dough, and the like, comprising:

a. frame means;

b. a pair of rollers mounted for rotation about parallel axes and having peripheral surfaces spaced by a predetermined distance;

c. a plurality of cutter disks of uniform diameter and mounted in spaced relation for rotation upon a common shaft;

d. guide means intermediate said pair of rollers and said cutter discs constructed and arranged to direct a sheet of dough emerging from between said rollers into engagement with said disks to be severed thereby into a plurality of side-by-side strips;

e. a pair of rigid arms mounted on opposite sides of said frame means and supporting said shaft therebetween;

f. a rigid bar supported at opposite ends upon portions of said arms parallel to and spaced from said shaft by a distance greater than the radius of said disks;

g. a rigid support member connected to said shaft and said bar to extend therebetween substantially perpendicular thereto, at a position intermediate of said arms;

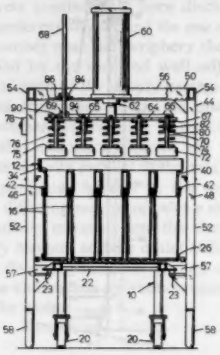
h. said arms being pivotally mounted upon pivot means provided on said frame means for rotation about a common axis parallel to and displaced from both said shaft and said bar.

4,045,152

APPARATUS FOR MAKING CHEESE

Harold J. Peterson, Dodgeville, and Wayne F. Kressin, Watertown, both of Wis., assignors to Kusel Equipment Company, Watertown, Wis.

Filed Sept. 2, 1975, Ser. No. 609,304
Int. Cl.[2] A01J *25/13, 25/15*
U.S. Cl. 425—419 **6 Claims**



1. A cheese processing apparatus comprising a cheese hoop supporting structure; a plurality of cheese hoops supported by said supporting structure in adjacent closely spaced relationship for receiving curds and whey to be poured therein; filler means removably connected to said cheese hoops to permit filling of said cheese hoops, said filler means including a tray having upwardly extending side walls, a bottom wall and a plurality of adjacent sleeves projecting downwardly from said bottom wall and receivable within said cheese hoops whereby curds and whey may be directed from said tray into each of said cheese hoops through said sleeves; and a vertical cheese press for compressing curds placed within said cheese hoops, said vertical press including a frame receiving said movable cheese hoop supporting structure and a force applying means supported by said frame; press head means suspended from said force applying means and operably connected to said force applying means for vertical movement; and a plurality of downwardly extending plunger means supported by said press head means for vertical movement therewith, each of said plunger means being receivable through a sleeve in one of said cheese hoops for compressing curds in said cheese hoop, means for independently shiftably supporting said plunger means on said press head means for vertical movement with respect to said press head and to other of said plunger means, and spring biasing means between each of said plunger means and said press head urging said plunger means downwardly with respect to said press head means, whereby the cheese within each of said hoops will be compressed uniformly.

4,045,153

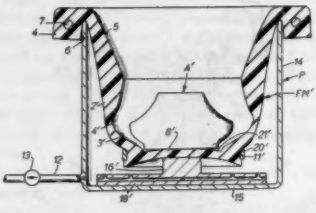
MOLDING APPARATUS INCLUDING ONE-PIECE FLEXIBLE MOLD AND MEANS TO RESTRICT THE DEFORMATION OF THE MOLD

William J. Maurino, and Raymond M. Putzer, both of Racine, Wis., assignors to Precision Flexmold, Inc., Racine, Wis.

Continuation of Ser. No. 542,214, Jan. 20, 1975, abandoned. This application Sept. 17, 1976, Ser. No. 724,356
Int. Cl.[2] B28B *7/06;* **B29C** *7/00*
U.S. Cl. 425—440 **8 Claims**

1. Apparatus for molding seamless articles comprising, a generally hollow one-piece distensible mold of elastomeric material having a vertically extending side wall and a bottom wall, a vacuum pot having a bottom wall and a side wall and

being of such size so as to receive said mold therein, said mold and pot forming an annular chamber therebetween, means connected to and for drawing a vacuum on said chamber whereby said mold distends downwardly and expands radially into said chamber to release the molded article from the mold, said vacuum pot having upwardly extending projection means from its said bottom wall, and said mold including means for supporting the mold side wall and the mold bottom wall, said



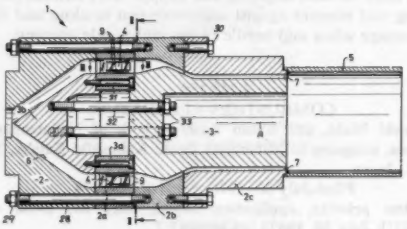
supporting means including a restraining ring member positioned around said mold side wall to restrict radial expansion of the bottom portion of said mold to prevent rupture thereof and for cooperation with said projection means to cause distortion of the bottom wall as the latter is distended downwardly to thereby free a molded article as said mold distends and expands into said pot so that the molded article may be easily removed from the mold.

4,045,154

DIE FOR EXTRUDING LARGE-DIAMETER TUBING

Heinz Ratheiser, Vienna, Austria, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Sept. 24, 1975, Ser. No. 616,306
Claims priority, application Germany, Sept. 28, 1974, 2446421
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—467 **9 Claims**



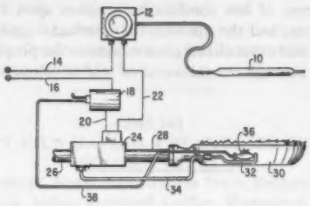
1. A tube-making die comprising:
a tube defining a flow axis and having an inner wall centered thereon;
a mandrel within said tube and having an outer wall centered on said axis and turned toward said inner wall, said walls defining an annular axially extending flow chamber; and
a plurality of webs extending radially between said tube and said mandrel for supporting said mandrel fixedly within said tube, each of said webs having axially extending side walls defining with said inner and outer walls a plurality of angularly spaced and axially extending passages being formed at the radial end of each of said webs with a groove extending axially of the respective passage, said grooves extending at least from the point of greatest transverse and tangential width of the respective web.

4,045,155

BURNER SYSTEM WITH ABSORBENT CARBON FLAME RESPONSIVE SWITCH

Denis G. Wolfe, Santa Ana, and Joseph S. Danon, El Toro, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 412,844, Nov. 5, 1973, Pat. No. 3,883,837.
This application Apr. 29, 1975, Ser. No. 572,801
Int. Cl.[2] F23N *5/02*
U.S. Cl. 431—42 **4 Claims**



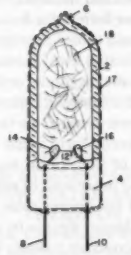
1. A burner system comprising
a main burner,
an electrically operated valve for controlling the supply of fuel to the main burner,
a pilot burner for igniting the main burner,
a flame sensing bulb positioned to be impinged upon by a flame from the pilot burner,
a flame switch having expandable and contractable means for opening and closing a pair of contacts in response to a gas pressure,
a tube connecting the flame sensing bulb to the expandable and contactable means of the flame switch,
a gas adsorbent material in the flame sensing bulb,
a charge of gas in the sensing bulb, the tube and the expandable and contractable means,
control means connected in series with the contacts of the switch means and the electrically operated valve for controlling the electrically operated valve, and
the gas adsorbent material including a material selected from carbonized polyvinylidene chloride and carbonized polyvinylidene fluoride.

4,045,156

PHOTOFLASH LAMP

Gordon P. K. Chu, Danvers; Dennis B. Shinn, Topsfield, and John F. Waymouth, Marblehead, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 23, 1974, Ser. No. 535,608
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—95 R **11 Claims**



1. A photoflash lamp comprising:
an hermetically sealed, light-transmitting envelope;
a quantity of combustible material located in said envelope;
a combustion-supporting gas in said envelope; and

ignition means attached to said envelope and disposed in operative relationship to said combustible material;

said envelope comprising a light-transmitting wall of uniformly crystallized glass having a mean coefficient of thermal expansion in the range of about 80 to 95 × 10^{-7} in./in./° C between 0° C and 300° C, whereby

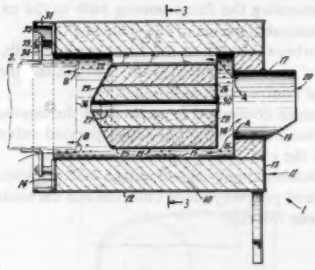
the relatively high refractoriness and strength of said crystallized glass wall render said envelope and the internal surface of said envelope particularly resistant to the thermal shock and mechanical stress resulting from the impingement of hot combustion residues upon flashing of said lamp, and the glass-crystal interfacial grain boundaries in said crystallized glass minimize the propagation of cracks through the thickness of said envelope.

4,045,157

SILENCER DEVICE FOR INDUSTRIAL BURNERS

Robert J. Peterson, Hillsdale, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 30, 1976, Ser. No. 681,773
Int. Cl.² F23D *15/02*
U.S. Cl. 431—114 **8 Claims**



1. A silencer device adapted to be positioned near the combustion air intake orifice of the burner tube of an industrial burner; comprising

an outer toroid member having an outer wall and an inner wall separated therefrom, said inner wall being perforated, the space between said inner and outer toroid walls containing sound absorbed material therein, the front end of said toroid member forming a front air intake port;

a core member within said toroid member, said core member having a face of perforated heat-resistant material directed toward said burner tube air intake orifice, said core member containing sound absorbent material behind said face;

means to fasten said core member to the inner wall of said toroid member to thereby form a first air passage from the front air intake port of said toroid member, between said core member and said inner wall of said toroid member, to said intake orifice of the burner tube;

means to secure said silencer device to said burner tube and to thereby form a second air passage between said burner tube intake orifice and the rear end of said toroid member;

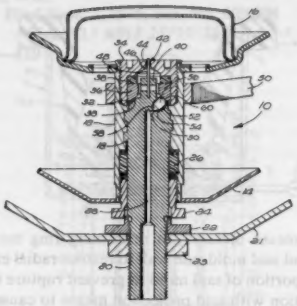
whereby the burner tube may be fastened to the silencer device with its intake orifice within said toroid member and said burner tube receives combustion air from both of said air passages and whereby noise from said burner tube is suppressed.

4,045,158

BURNER ASSEMBLY

Donald L. Coombs, and Richard E. Hollis, both of Springfield, Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 16, 1976, Ser. No. 696,784
Int. Cl.² F24C *5/02*
U.S. Cl. 431—123 **5 Claims**



1. A burner assembly for liquid fuels comprising a stem member having a fuel passage therein, a body member engaging said stem member and axially movable thereon upon relative rotation therebetween, means providing a valve between said stem member and said body member, said body member including a nozzle having a nozzle opening therein, a needle carried by said stem member, said needle extending into said nozzle opening to close said opening when said valve means is in a closed position and being retractable to control said nozzle opening when said body member is moved relative to said stem member to open said valve means, said valve means comprising:

a generally transversely extending surface on said stem member, said fuel passage opening at said surface;

a valve seat in said fuel passage below said surface;

a poppet valve element loosely mounted in said fuel passage above said seat; and

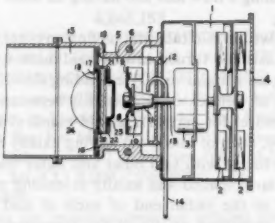
said body member engaging said poppet valve element pushing said element against said valve seat to close said fuel passage when said needle closes said nozzle opening.

4,045,159

COMBUSTION APPARATUS

Atsuyoshi Nishi, and Katuo Yashiro, both of Nakatsugawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1975, Ser. No. 600,378
Claims priority, application Japan, July 30, 1974, 49-90976[U]; July 30, 19874, 49-90980[U]
Int. Cl.² F23D *13/40*
U.S. Cl. 431—328 **5 Claims**



1. A combustion apparatus which comprises:

a mixing chamber for mixing a fuel and air for combustion separately introduced thereinto;

a combustion chamber for combustion of the mixed combustible gas being disposed adjacent to said mixing chamber;

a flame holes plate disposed between said mixing chamber and said combustion chamber for forming a combustion flame at a flame projecting aperture of said flame holes plate by injecting the mixed combustible gas from said mixing chamber therethrough to said combustion chamber; and

foraminous means disposed immediately adjacent said flame holes plate for uniformly maintaining the velocity of the mixed combustible gas injected from said mixing chamber through the flame projecting aperture of said flame holes plate to the combustion chamber over the entire peripheral part thereof lower than that at the central part thereof, wherein said velocity maintaining means comprises;

a porous plate between said flame holes plate and said mixing chamber; and

a choke plate having an opening which is smaller than said flame projecting aperture of said flame holes plate and being concentrically positioned on the mixing chamber side of said flame holes plate and said porous plate,

whereby the velocity of said mixed combustible gas injected from said mixing chamber through said opening of said choke plate, said porous plate and said flame projecting aperture of said flame holes plate to the combustion chamber is lower at the peripheral parts thereof than at the central parts thereof.

4,045,160

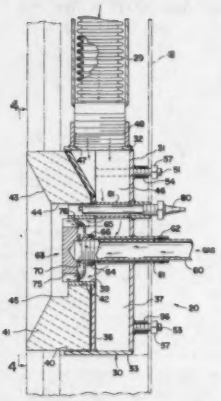
FLAT-FLAME GAS BURNER

Norman C. Michels, Bay Village, Ohio, assignor to Lee Wilson Engineering Company, Inc., Cleveland, Ohio

Filed Feb. 9, 1976, Ser. No. 656,519

Int. Cl.² F23D *13/12*

U.S. Cl. 431—348 **5 Claims**



1. A fuel gas burner adapted for mounting in a furnace wall facing the interior of the furnace and comprising:

an air inlet tube connected to said housing and having a section thereof extending through a portion of the wall of said furnace to heat air passing therethrough,

a housing defining an air plenum communicating with said air inlet, and also defining a forwardly facing plenum throat,

a combustion block formed of refractory material mounted in said housing surrounding said plenum throat and having a generally frusto-conical surface,

a fuel gas supply tube extending into said plenum throat,

distributor means mounted at the inner end of said supply tube and extending radially outward toward said plenum throat and defining therewith an annular air passage communicating with said plenum,

a nozzle element mounted at the inner end of said gas supply tube and defining with said distributor means a fuel gas chamber communicating with and located around said gas supply tube, said nozzle element having radially extending, pitched circumferential vanes that define swirl producing slots adapted to receive air from said plenum through said annular passage,

means for introducing fuel gas from said fuel gas chamber into said slots to be mixed with air, and

means for igniting the resulting fuel-air mixture to produce a generally flat-flame extending radially outwardly adjacent said frusto-conical surface.

4,045,161

ROTARY KILN HAVING A PLANETARY ROW OF COOLER TUBES

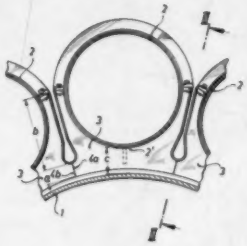
Hans Mollenkopf, Neubeckum; Jurgen Wurr, Ennigerloh; Antonius Vering, Ahlen; Bernhard Loffler, Warendorf, and Karl Eiring, Oelde, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Nov. 18, 1975, Ser. No. 632,997

Claims priority, application Germany, Dec. 13, 1974, 7441586[U]

Int. Cl.² F27B *7/38*

U.S. Cl. 432—80 **6 Claims**



1. A rotary kiln comprising a casing having an annular peripheral wall, a row of substantially parallel circumferentially spaced cooler tubes disposed around the periphery of said casing, and a plurality of individual heat conductive mounting plate means for said tubes, separately secured to said casing wall, the radially inner region of each individual mounting plate means near the casing being in side edge abutment with the corresponding inner region of each adjacent mounting plate means circumferentially of said casing and outer regions of adjacent mounting plate means located radially outward of said inner regions being spaced from one another in non-heat conducting relation circumferentially of said casing, the abutting radially inner regions of said plurality of said mounting plate means forming a substantially continuous annular link extending peripherally around said casing, and said tubes being disposed radially outwardly of said link.

4,045,162

METHOD OF BURNING GRANULAR OR PULVERULENT RAW MATERIAL AND KILN PLANT THEREFOR

Søren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Oct. 28, 1975, Ser. No. 626,478

Claims priority, application United Kingdom, Oct. 30, 1974, 47021/74

Int. Cl.² F27B *7/02*

U.S. Cl. 432—14 **33 Claims**

1. A method of heat treating granular or pulverulent raw

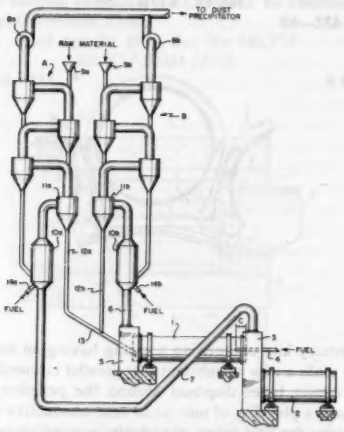
material by means of a suspension heat exchanger connected to the material inlet end portion of a rotary kiln having a burner pipe extending into the material outlet end portion, said heat exchanger including at least first and second multi-stage string preheating units operating in parallel, each of said units having at least one cyclone preheater stage defining a heat exchange zone in which the granular or pulverulent raw material is brought into heat exchange relationship with hot gases and a lowermost calcination stage for preheating and at least partially calcining the raw material, means to supply raw material to each of said multi-stage string preheater units, means for directing the preheated, at least partially calcined raw material to said material inlet end portion of said rotary kiln for sintering, and cooling means communicating with said rotary kiln defining a heat exchange zone in which the sintered material is brought into heat exchange relationship with cooling air comprising:

a. directing raw material to said multi-stage string preheating units for preheating and at least partially calcining the material;

b. feeding preheated, at least partially calcined material from said heat exchanger into said rotary kiln;

c. sintering the preheated, at least partially calcined material in said kiln;

d. directing the sintered material from said kiln into said communicating cooling means;



e. directing cooling air into said cooling means so as to contact said sintered material to effect a heat exchange between the sintered material and the cooling air thereby at least partially cooling the sintered material and at least partially heating the cooling air;

f. dividing the heated cooling air exiting the cooling means and directing a first portion of said heated cooling air to at least one of said calcination stages of at least a first of said multi-stage preheating units of said heat exchanger and directing a second portion thereof to said kiln in excess of that required to support combustion of fuel in the kiln for the sintering process thereby creating an intensified material cooling zone between the mouth of said burner pipe and the material exit end portion of said rotary kiln;

g. directing hot kiln exit gases to said calcination stage of at least a second of said multi-stage string preheating units; and

h. directing fuel to at least one of said calcination stages of said multi-stage string preheating units to support combustion with at least partially heated cooling air and thereby provide supplementary heating and at least partial calcining of said preheated material.

20. A plant for heat treating granular or pulverulent raw material which comprises:

a. a heat exchanger having at least two preheating units operating in parallel relation, each preheating unit having at least a first preheater stage for preheating raw material, and at least a lowermost calcination stage to at least partially calcine the preheated raw material;

b. an inclined rotary kiln communicating with said exchanger and adapted and positioned to receive preheated, at least partially calcined material from said heat exchanger for sintering, said kiln having a material discharge end portion and a burner pipe extending into the material discharge end portion;

c. matterial cooling means communicating with the material discharge end portion of said rotary kiln and adapted to receive sintered material discharged from said material discharge end portion of said kiln;

d. means for dividing waste heated cooling air leaving the cooling means and for directing at least a portion of said cooling air to at least one of said calcination chambers of said heat exchanger and a portion to said kiln in excess of the air required to support combustion in the kiln for the sintering process, said excess cooling air thereby creating an intensive material cooling zone between the mouth of said burner pipe and the material outlet end portion of said rotary kiln;

e. means to direct hot kiln exit gases to at least one calcination stage of said heat exchanger; and

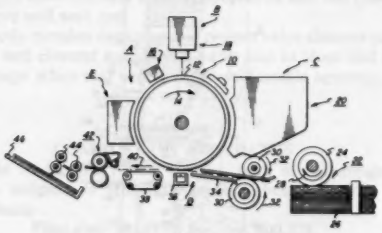
f. means to supply fuel to at least one of said calcination stages to support combustion therein with preheated cooling air to provide supplementary heat for said material and to at least partially calcine said preheated material.

4,045,163

HEATED FUSER RELEASE AGENT CONTAINER

Sukumaran K. Menon, Webster, and Louis R. Hattler, Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1976, Ser. No. 719,043
Int. Cl.[2] F27B 9/28
U.S. Cl. 432—59 **4 Claims**



1. An apparatus for metering a quantity of release material to a fuser member operatively associated with a back-up member to substantially fix particles to a sheet of support material passing therebetween, including:

a housing defining a chamber for storing therein the release material, said housing comprising an inner shell defining the chamber for storing therein the release material, and an outer liner mounted contiguous with said inner shell and being made preferably from a thermally insulating material to substantially reduce loss of heat from the release material to the environment;

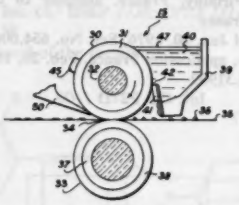
a substantially tubular heating member positioned in contact with a portion of said inner shell for heating said housing to maintain the release material in a substantially fluid state; and

means for applying release material from said housing to the surface of the fuser member.

4,045,164
USE OF SILICONE OIL AS A POLYETHYLENE OXIDATION RETARDANT IN A TONER IMAGE FUSING APPARATUS

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 22, 1974, Ser. No. 490,541
Int. Cl.[2] F27B 9/28
U.S. Cl. 432—60 5 Claims



1. Contact fuser apparatus for fixing toner images to support sheets, said apparatus comprising:

a heated fuser roll structure having a rigid, thermally conductive outer surface;

a backup roll forming a nip with said fuser roll structure through which said support sheets move with said toner images contacting said fuser roll structure;

thermally degradable means adapted to chemically react with said surface to form a thin toner impenetrable layer thereon;

a sump containing a quantity of said means adapted to chemically react with said surface;

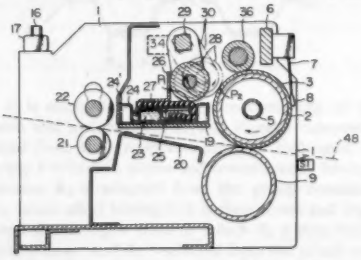
means supporting said sump adjacent said fuser roll structure such that said surface directly contacts said chemically reacting material;

means for controlling the reactivity between said surface and the chemically reacting material contacted thereby whereby formation of a bead on said surface is retarded and wherein said thermally degradable material comprises polyethylene and said means for controlling reactivity comprises silicone oil.

4,045,165
CONTACT HEAT FIXING DEVICE

Takanobu Nakajima, Kashihara; Toshikazu Matsui, Kishiwada, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Oct. 17, 1975, Ser. No. 623,327
Claims priority, application Japan, Oct. 19, 1974, 49-120466
Int. Cl.[2] F27B 9/28
U.S. Cl. 432—60 4 Claims

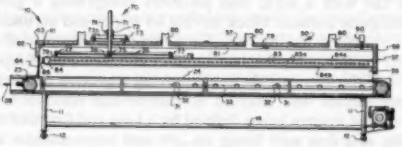


1. A contact heat fixing device which comprises a driving heated roller having a heating mechanism disposed in the interior thereof and a surface coated with an offset preventing material, a press roller which is rotatable in intimate contact under pressure with said heated roller, said press roller and heated roller being rotatably mounted on a frame plate, a vessel for containing therein an offset preventing liquid and a feed mechanism for supplying the offset preventing liquid to the heated roller from the vessel, fixation of a toner image being accomplished by the passage of a support having the toner image thereon through the nip position of the heated roller and the press roller, wherein said feed mechanism includes an applicator for applying the offset preventing liquid to the surface of the heated roller and supply means for supplying the offset preventing liquid from the vessel to the applicator, said applicator being a roller, at least the surface portion of which is composed of a porous, heat-resistant and abrasion resistant material having a liquid absorbing property, said applicator roller being supported by a swingable arm so that it can be rotated only in the same direction as that of rotation of the heated roller and it can shift between a position (P1) where it has a pressing contact with said supply means and a position (P2) where it has a pressing contact with said heated roller, said swingable arm being fixed to a shaft which is rotatably mounted on the frame plate and connected through a linkage to an electromagnetic solenoid mechanism said solenoid mechanism being energized in connection with a mechanism to be actuated at every copying operation synchronously with feeding of the support, so that when said solenoid mechanism is energized, the applicator roller is moved to said position P2 to have a temporary contact with the surface of the heated roller and apply thereto the offset preventing liquid and when said solenoid mechanism is de-energized, said applicator roller being returned to the original position P1 by its own weight, and said applicator roller and said supply means being arranged in such a positional relationship that while the applicator roller shifts from the position P1 to the position P2, the applicator roller is rotated by frication with said supply means.

4,045,166
ARABIC BREAD OVEN

Jack T. Kaleel, 3801 Loretta Drive, Salt Lake City, Utah 84106

Filed Sept. 18, 1975, Ser. No. 614,508
Int. Cl.[2] F27B 9/00
U.S. Cl. 432—146 6 Claims



1. An oven for baking Arabic-style bread and the like, comprising an endless mesh conveyor belt having an upper run and a lower run;

drive means for driving the conveyor belt;

support means for the conveyor belt and the drive means;

a housing having side walls extending upwardly from the edges of the upper run of the conveyor belt, a top wall interconnecting the side walls above the conveyor belt, an inlet end wall interconnecting the side and top walls and extending from the top wall towards the upper run of the conveyor belt to a location such that Arabic-style dough formed into a flat configuration and placed on the upper run of the belt can pass thereunder, a discharge end wall at the other end of the housing interconnecting the top and side walls and extending towards the belt to a distance such that a baked loaf of Arabic-style bread on the conveyor can pass thereunder, out of the housing, and a flexible flap fixed to and extending downwardly from the discharge end wall, between the side walls and terminating at about the upper surface of the upper run of the conveyor belt;

spaced lower burners extending transversely to the direction of travel of the conveyor belt between the upper run and the lower return run of the belt, said burners being ar-

ranged from the inlet to the housing to a location beyond half the length of the housing;

means mounting said lower burners to be movable towards and away from said upper run;

upper burners in the housing above the upper run of the conveyor belt, said burners extending transversely to the upper run of the belt and being spaced in the housing from the discharge end of the housing less than one-half the length of the housing;

means mounting the upper burners to be adjustable towards and away from the upper run of the conveyor belt;

means for venting the interior of the housing, said means comprising

interconnected chambers formed in the side and top walls of the housing;

vent stacks connected into the chambers in the top wall;

openings in the side wall interconnecting the interior of the oven with the chambers in the walls; and

means for adjustably covering the said openings.

4,045,167

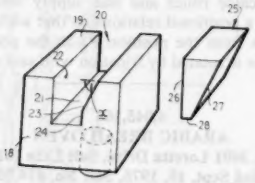
MUFFLED KILN CARS

John Elliott, Stoke-on-Trent, England, assignor to Acme Marls Limited, Stoke-on-Trent, England

Filed Nov. 6, 1975, Ser. No. 629,397

Int. Cl.² F27D *3/12*

U.S. Cl. 432—241 **2 Claims**



1. A clip assembly for a removable baffle plate of a muffled kiln car with a shelf, said assembly comprising a generally rectangular ceramic block having an upper and an under surface, the block having swivel mounting means provided on the under surface, adapted to swivelably mount the block upon the shelf of the kiln car, the block having a groove defined in its upper surface and adapted to receive the removable baffle plate, said groove being defined by a base and first and second walls, said first wall being upright and perpendicular to said upper surface, said second wall being inclined away from said first wall at least adjacent said upper surface of the block so as to intersect said upper surface at an angle in the range 60° to 70°, the assembly also comprising a truncated wedge of ceramic material having an apex angle in the range 20° to 30° and adapted to be inserted between the removable baffle plate and said second wall of the groove.

4,045,168

DEVICE FOR MOUNTING PANELS OF FIBROUS REFRACTORY MATERIAL

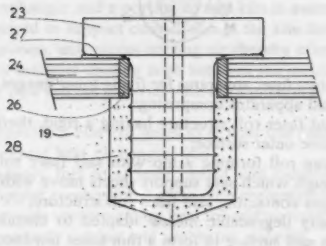
Lucien Abrial, Firminy, France, assignor to Creusot-Loire, Paris-Cedex, France

Filed Jan. 30, 1976, Ser. No. 654,006

Claims priority, application France, Feb. 26, 1975, 75.05923; Oct. 17, 1975, 75.31909

Int. Cl.² F27D *1/00*

U.S. Cl. 432—247 **5 Claims**



1. A device for mounting panels of fibrous refractory material of a predetermined thickness against a wall of an industrial furnace, the device comprising:

a plug of refractory material having the form of a bolt with a square head and a non-threaded cylindrical shank provided with a plurality of circular ribs, said plug having an axis arranged in planes perpendicular to the axis of said plug, the panels to be attached thereby having spaced-apart apertures of dimensions intermediate those of said head and of said ribs on the shank, and the wall of the furnace having corresponding cavities filled with a sealing material and for receiving said shank of the plug; and

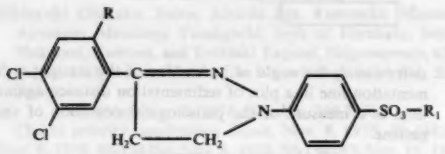
two washers of combustible material, which are to be burned in the furnace and thereby eliminated at the first heating, one of said washers being adapted to be arranged between said head of the plug and the refractory panel to be mounted by said plug, the other of said washers having a height substantially equal to the thickness of the panel, and being adapted to line the apertures in the panel into which said plug is introduced and consequently surround a portion of said shank of the plug adjacent said head.

4,045,169
3-[3',4'-DICHLORO-6'-ALKYL-PHENYL]-Δ 2-PYRAZOLINE DERIVATIVES AND THEIR USE AS OPTICAL BRIGHTENERS

Helmut Mengler, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 483,355, June 26, 1974, Pat. No. 3,957,815, which is a division of Ser. No. 287,075, Sept. 7, 1972, Pat. No. 3,865,816. This application Feb. 18, 1976, Ser. No. 658,881
Claims priority, application Germany, Sept. 9, 1971, 2145019
Int. Cl.[2] D06P *1/38*; C07D *231/06*
U.S. Cl. 8—1 W 9 Claims

1. A compound of the formula



in which R is alkyl of 1 to 4 carbon atoms and R_1 is alkyl of 1 to 20 carbon atoms.

5. A process for optically brightening synthetic fibers which comprises contacting the synthetic fiber with a compound as defined in claim 1.

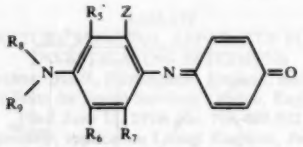
4,045,170
HAIR DYE COMPOSITION CONTAINING AN INDOANILINE

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 580,830, May 27, 1975, Pat. No. 3,963,764, which is a continuation-in-part of Ser. No. 249,227, May 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 213,750, Dec. 29, 1971, Pat. No. 3,867,094. This application Mar. 1, 1976, Ser. No. 662,964
Claims priority, application Luxembourg, May 10, 1971, 63145; May 10, 1971, 63144; Dec. 30, 1970, 62348
Int. Cl.[2] D06P *3/08*
U.S. Cl. 8—11 16 Claims

1. A dye composition for keratinic fibers comprising an aqueous or aqueous alcoholic solution of an indoaniline selected from the group consisting of

a. an indoaniline having the formula



wherein Z is selected from the group consisting of amino, acetylamino and hydroxy; R_5, R_6 and R_7 each independently are selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and lower alkoxy having 1–6 carbon atoms; R_8 is selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and together with R_5 and the nitrogen atom to which R_8 is attached form dihydro-paroxazine; and R_9 is selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and together with R_8 and the nitrogen atom to which R_9 is attached form dihydro-paroxazine, with the proviso that at least two of R_5, R_6, R_7, R_8 and R_9 are other than hydrogen when Z is NH_2 and that only one of R_8 and R_9 form dihydro-paroxazine;

b. an acid salt of said indoaniline in (a); and

c. a double chloride of zinc and said indoaniline in (a);

said indoaniline being present in an amount effective to color said fibers.

4,045,171
TREATMENT OF DYE WASTES

Leslie Emery Lancy, Ellwood City, Pa., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 28, 1975, Ser. No. 563,026
Int. Cl.[2] D06P *5/10*
U.S. Cl. 8—74 10 Claims

1. In a dyeing process for the production of color fast dyed textile articles wherein an undyed article is immersed in a dye bath for absorption of dye into its pores, and the dyed article having excess dye solution adhering to its surfaces is removed from said dye bath, the improvement which comprises:

contacting the removed article and the excess dye solution adhering thereto in a precipitation zone with an aqueous solution of a salt selected from halides or sulfates of metals of Group IA or Group IIA of the Periodic Chart in amounts such that the concentration of salt in the precipitation zone is at least 100 grams per liter of total liquid to precipitate the dye absorbed in the pores, to rinse the excess dye from the article and to precipitate said excess dye;

separating the precipitated dye from the aqueous salt solution substantially free of color,

recovering the aqueous salt solution for reuse in the precipitation zone, and

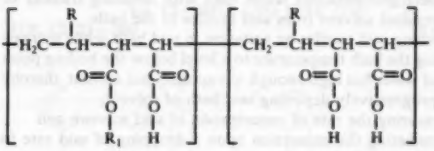
recovering a color fast dyed textile article.

4,045,172
TEXTILE SOIL RELEASE COMPOSITION AND METHOD

John J. Duncan, Chattanooga, Tenn., and Alexander Kirjanov, S. Hamilton, Mass., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 358,852, May 10, 1973, abandoned. This application Apr. 1, 1975, Ser. No. 564,156
Int. Cl.[2] D06M *15/38*
U.S. Cl. 8—115.7 2 Claims

1. A polyester-containing cellulosic textile having thereon a cured soil-release composition which imparts soil-release properties thereto, comprising said soil-release composition having been applied to said textile and cured thereon, the latter composition comprising partial alkyl and oxyalkyl esters having the formula:



wherein R is an alkoxy group of 1 to about 7 carbon atoms, R_1 is selected from the group consisting of an alkyl chain having from 1 to 7 carbon atoms, an oxyalkylene chain having the formula:

$$R_2—(O—C_2H_4—)_m$$

in which R_2 is an alkyl chain having from 1 to about 30 carbon atoms and m is an integer of 1 to about 10, and mixtures thereof; x is between 40% and 50% by weight; y is between 50% and 60% by weight; and $x + y = 100\%$ by weight, said interpolymer being water-dispersible, having an acid number at least 5% higher than the theoretical acid number of the full half ester, and an nsp value of from about 0.2 to 3.5, based upon the specific viscosity of a one-gram concentration of said interpolymer in methyl ethyl ketone at 25° C., the pH of said inter-

polymer composition in water ranging from between 2.2 and about 4.0 and being controlled, as required, through the addition of a base.

4,045,173

TEXTILES FLAME RETARDED WITH HYDROXYMETHYLPHOSPHORUS COMPOUNDS IN COMBINATION WITH POLY(ETHYLENEUREAS) AND POLY(N-METHYLOLETHYLENEUREAS)

Stanley P. Rowland, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 18, 1975, Ser. No. 633,069
Int. Cl.² D06M *13/30*
U.S. Cl. 8—116 P **2 Claims**

1. A process for imparting durable flame retardancy to textiles comprising:

a. impregnating a textile fabric in an aqueous solution containing a nitrogeneous compound selected from the group consisting of a poly(ethyleneurea) made by reacting urea with a polyamine from the class of polyethylenamine or polyethyleneimine and a poly(N-methylolethyleneurea) made by the methylolation of the above-mentioned poly(ethyleneurea) and a phosphorus containing compound selected from the group consisting of tetrakis(hydroxymethyl)phosphonium chloride, tetrakis(hydroxymethyl)phosphonium hydroxide and tris(hydroxymethyl)-phosphine; and

b. drying and curing the impregnated fabric from (a).

4,045,174

METHOD OF CLEANING TEXTILES

Heinrich Fuhring, Augsburg, and Johannes Helmut Sieber, Aystetten, both of Germany, assignors to Bowe, Bohler & Weber KG Maschinenfabrik, Augsburg, Germany

Filed Jan. 10, 1975, Ser. No. 539,993
Claims priority, application Germany, Jan. 11, 1974, 2401296
Int. Cl.² D06L *1/00*
U.S. Cl. 8—142 **5 Claims**

1. A method of cleaning textiles, comprising the steps of:

presoaking a load of textiles to be cleaned within a vessel in an organic dry cleaning solvent vaporizable, at least when in an aqueous azeotropic mixture, at a boiling point lower than that of water;

removing excess solvent from the presoaked textiles while leaving some wetted with residual solvent;

immersing the solvent-wetted textiles within said vessel in a detergent-enriched water bath with resulting transfer of residual solvent from said textiles to the bath;

washing said textiles by agitation in said bath while increasing the bath temperature to a level below the boiling point of water but high enough to vaporize said solvent, thereby progressively depleting said bath of solvent;

measuring the rate of vaporization of said solvent; and

terminating the immersion upon a dropping of said rate to substantially zero.

4,045,175

MICRO-METHOD OF ERYTHROCYTE SEDIMENTATION

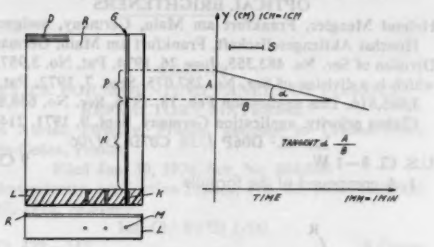
Ragnar Weber, No. 67, Rainweg, 6904 Ziegelhausen, Germany

Filed Dec. 10, 1975, Ser. No. 639,323
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **1 Claim**

1. A micro-method of determining erythrocyte sedimentation in the blood of a patient, said method comprising

a. introducing a blood sample into a vertical capillary tube having an anticoagulant heparin coating on the interior surface thereof,

b. measuring the distance from the original level of the blood in said tube to the erythrocyte level at a predetermined time interval after the blood sample is introduced into the tube, and



c. determining the angle of inclination of the straight sedimentation line in a plot of sedimentation distance against time as a measure of the pathological condition of said patient.

4,045,176

PREPARATION OF OPTICALLY CLEAR SERUM

Gary J. Proksch, 586 W. 77th North Drive, and Dean P. Bonderman, 1045 W. 77th South Drive, both of Indianapolis, Ind. 46260

Continuation-in-part of Ser. No. 586,569, June 13, 1975, Pat. No. 3,955,925, which is a continuation of Ser. No. 414,799, Nov. 12, 1973, abandoned. This application Mar. 29, 1976, Ser. No. 671,175
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **20 Claims**

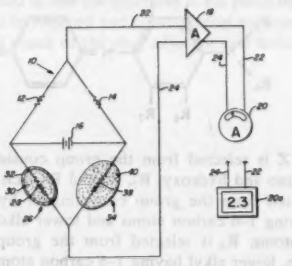
1. A substantially human serum for use as a standard or reference material is assaying human blood, said human serum being improved by containing in addition to essentially all normal human serum components, isolated non-primate, animal lipoproteins which contain cholesterol.

4,045,177

APPARATUS FOR DETECTING COMBUSTIBLE GASES

Frank X. McNally, Venetia, Pa., assignor to CSE Corporation, Monroeville, Pa.

Filed Aug. 16, 1976, Ser. No. 714,602
Int. Cl.² G01N *27/16*
U.S. Cl. 23—254 E **6 Claims**



1. In an apparatus for detecting a combustible gas, such as methane, by a combination including a Wheatstone bridge circuit having a reference element comprising an electrically conducting member coated with a refractory, said reference element constituting one leg of said bridge, a detector element comprising an electrically conducting member coated with a refractory and having on the surface of said refractory a catalyst for the oxidation of said gas, said detector element consti-

tuting a second leg of said bridge, whereby upon catalytic oxidation of said gas an electrical signal approximately proportional to the amount of said gas present at the detector element is produced, the improvement comprising means at said reference element which increases its emissivity to the same emissivity as that of said detector element, whereby the energy radiation of the reference element is substantially linearly proportional to the energy radiation of the detector element during oxidation of said combustible gas at said detector element.

4,045,178
REDUCING GAS SENSOR

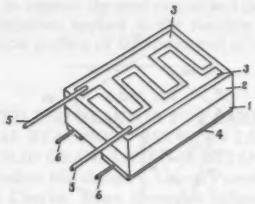
Hideyuki Okinaka, Setsu; Atsushi Iga, Tatatsuki; Masatake Ayusawa; Masatugu Yamaguchi, both of Hirakata; Seiichi Nakatani, Kadoma, and Toshiaki Yagami, Shijyonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 3, 1976, Ser. No. 738,745

Claims priority, application Japan, Nov. 8, 1975, 50-134285; Nov. 8, 1975, 50-134286; Nov. 8, 1975, 50-134287; Nov. 11, 1975, 50-135772; Nov. 11, 1975, 50-135773; Nov. 13, 1975, 50-136941

Int. Cl.² G01N *27/12*

U.S. Cl. 23—254 E **11 Claims**



1. A reducing gas sensor comprising a gas sensitive element composed of, as a main constituent, γ-ferric oxide (γ-Fe_2O_3) and, as an additive, at least one member selected from the group consisting of WO_3, MoO_3, SiO_2, GeO_2, Li_2O, Na_2O, K_2O, CaO, SrO, BaO, Eu_2O_3, La_2O_3, CeO_2, Al_2O_3, Ga_2O_3, In_2O_3, SnO_2, TiO_2, MgO, NiO, ZnO, Mn_2O_3 and Cr_2O_3, a pair of electrodes on said sensitive element and a heater element adjacent said element, whereby when said gas sensitive element is heated to an elevated temperature it undergoes a rapid decrease in electrical resistance upon coming in contact with an atmosphere containing a reducing gas.

4,045,179
TEMPERATURE CONTROL APPARATUS FOR USE IN INVESTIGATING SPECIMENS

Roger Abraham Bunce, Birmingham, England, assignor to Secretary of State for Social Services, London, England

Filed June 11, 1976, Ser. No. 695,032

Claims priority, application United Kingdom, June 11, 1975, 35118/75

Int. Cl.² F27D *11/00*; B01L *7/02, 9/06*; G01N *1/10*

U.S. Cl. 23—259 **6 Claims**

1. Apparatus for use in investigating specimens, comprising:

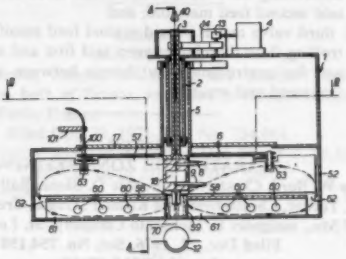
a. a substantially horizontal turntable having a central rotational axis and being adapted to support in a circular array centered on the said rotational axis a plurality of specimen vessels, each such vessel being positionable to extend down below the underside of the turntable;

b. means for stepwise advancing the turntable about the said rotational axis so that, during dwell periods of the turntable, specimens deposited during previous dwell periods in the vessels may be investigated;

c. an enclosure disposed beneath the turntable having an internal surface symetrically positioned about the said rotational axis so as to define a space bounded laterally and at the bottom by the said enclosure and upwardly by the turntable;

d. a baffle plate disposed within the enclosure so as to provide between this plate and the turntable a first space into which the vessels extend when supported by the turntable, and between said plate and the base of the said enclosure a second space, the outer edge of the baffle plate being separated by an air gap from the peripheral wall of said enclosure, said baffle plate being a central hole for air to circulate between said first and second spaces by way of the air gap and the said central hole;

e. a rotary vane disposed in the said first space and mounted



with its axis of rotation coincident with that of the turntable, the vane being formed with at least one cut-out portion as necessary to permit relative rotational movement between the turntable containing vessels and the vane, the shape of said vane conforming substantially the vertical cross-sectional shape of said first space so that upon rotation it sweeps out a volume substantially equal to that of the said first space:

f. air temperature changing means disposed in said second space; and

g. a control device for the air temperature changing means to maintain the temperature of the vessels substantially at a predetermined value.

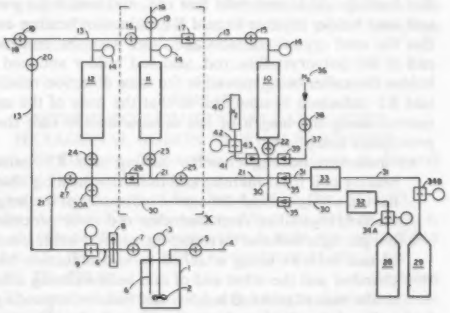
4,045,180
APPARATUS FOR COPOLYMERIZING GASEOUS MONOMERS

Robert Hayward Young, Somerville, and Markus Matzner, Edison, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 4, 1976, Ser. No. 693,131

Int. Cl.² B01J *1/00*; C08F *2/00*

U.S. Cl. 23—260 **9 Claims**



1. Apparatus for copolymerizing at least two gaseous monomers comprising:

A. a closed reactor for receiving said monomers and subjecting them to copolymerizing conditions;

B. at least three feed tanks for containing said monomers

under pressure under conditions which preclude copolymerization;

C. a first feed manifold connected to one end of each said tank and to said reactor;

D. first valve means in said first feed manifold for controlling flow therein between the first and second of said feed tanks. for controlling flow therein between the second and third of said feed tanks and for controlling flow therein between said feed tanks and said reactor;

E. a second feed manifold connected to the other end of each of said feed tanks and to said reactor;

F. second valve means in said second feed manifold for controlling flow from each of said three feed tanks into said second feed manifold; and

G. third valve means in said second feed manifold for controlling flow therein between said first and second tanks and for controlling flow therein between all said feed tanks and said reactor.

4,045,181

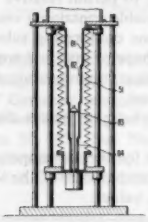
APPARATUS FOR ZONE REFINING

John W. Burd, Chesterfield; Bobbie D. Stone, Ballwin; William F. Tucker, Chesterfield, and Kedar P. Gupta, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1976, Ser. No. 754,155

Int. Cl.[2] B01J *17/10*

U.S. Cl. 23—273 R **7 Claims**



1. In an apparatus for zone refining polycrystalline semiconductor rods to produce monocrystalline semiconductor rods, said apparatus having an RF induction heating coil, a rod holder and a seed holder aligned vertically above and below said heating coil, said rod holder being adapted to hold one end of a polycrystalline semiconductor rod to be refined and said seed holder being adapted to hold a seed crystal of said semiconductor, means for moving said rod holder relative to said RF induction heating coil to bring the free end of the polycrystalline semiconductor rod into proximity with said RF induction heating coil to melt said free end, and means for moving said seed holder relative to said RF induction heating coil so that the seed crystal contacts and fuses with the molten free end of the polycrystalline rod, said rod holder and said seed holder thereafter being moved in the same direction relative to said RF induction heating coil so that the zone of the melt is moved along the length of the semiconductor rod, the improvement comprising:

an induction heating chamber having said RF inductive heating coil fixed therein, said induction heating chamber having a longitudinal dimension indendent of the length of the polycrystalline semiconductor rod to be processed,

a first gas tight bellows surrounding said rod holder, one end of said bellows being attached to said induction heating chamber and the other end of said bellows being attached to the base of said rod holder, said bellows expanding and collapsing with the relative movement of said rod holder and said RF induction heating coil,

a second gas tight bellows surrounding said seed holder, one end of said bellows being attached to said induction heating chamber and the other end of said bellows being attached to the base of said seed holder, said bellows expanding and collapsing with the relative movement of said seed holder said RF induction heating coil, and

a plurality of telescoping metallic cylinders surrounding said seed holder. within said corresponding second gas tight bellows, the largest of the telescoping metallic cylinders being attached in common with said second bellows to said induction heating chamber and the smallest of the telescoping steel cylinders being attached to the base of said seed holder, said plurality of telescoping metallic cylinders serving to protect said second bellows from molten semiconductor at all times when zone refining is taking place.

4,045,182

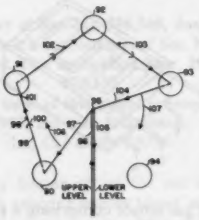
HYDRODESULFURIZATION APPARATUS WITH UPSTAGED REACTOR ZONES

William S. Bonnell, Mount Lebanon; Robert D. Christman, Pittsburgh; Jordan S. Lasher, Pittsburgh; John A. Paraskos, Pittsburgh, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 632,374, Nov. 17, 1975, Pat. No. 4,017,382. This application Aug. 17, 1976, Ser. No. 715,035

Int. Cl.[2] B01J *8/04, 1/00*

U.S. Cl. 23—288 R **5 Claims**



1. A reactor apparatus comprising three or more reactor means disposed substantially equidistantly with respect to each adjacent other reactor with each centered on the locus of a circle, connecting conduit means, free of valves, between at least two adjacent reactor means including a lead reactor means and an end reactor means to provide series flow between said adjacent reactor means, at least one reactor means being disconnected from said series flow system, feed conduit means extending radially from substantially the center of said circle to the lead reactor means in said series, discharging conduit means also extending radially from substantially the center of said circle to the end reactor means of said series, first conduit disconnecting means disposed at the center of the circle permitting said feed conduit means to be rotated to or from any of the reactor means in the circle and second conduit disconnecting means disposed at the center of the circle permitting said discharge conduit means to be rotated to or from any of the reactor means in the circle.

4,045,183

SUPPORT DEVICE FOR USE IN A CRUCIBLE-FREE FLOATING ZONE MELTING APPARATUS

Gerhard Barowski; Wolfgang Keller, and Gerhard Schroetter, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 18, 1975, Ser. No. 632,957

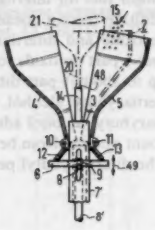
Claims priority, application Germany, Nov. 21, 1974, 2455173

Int. Cl.[2] B01J *17/10*

U.S. Cl. 23—273 SP **17 Claims**

1. In an apparatus for crucible-free zone melting of a crystalline rod of semiconductor material which rod is vertically mounted in the apparatus by mounting means engaging each end of the rod with the lower end of the rod having a junction

surface with a seed crystal, said apparatus having a container attached for rotation with the lower mounting means and surrounding said lower end for receiving a stabilization medium to support said lower end from vibration, the improvements comprising said container comprising a plurality of individual sections, said sections being moveable relative to each other from a first position spaced from the seed crystal



and said lower end of the rod to enable melting of the rod adjacent to the junction surface to a second position forming the container and surrounding both the seed crystal and said lower end of the rod, and means for holding the sections in said second position so that the container can receive the stabilization medium to support the seed crystal and the end of the rod to reduce vibrations applied to the junction surface and an adjacent conical portion of the lower end of the rod.

4,045,184

FLUIDIZED-BED REACTOR FOR CARRYING OUT CHEMICAL REACTIONS BETWEEN LIQUIDS AND SOLID GRANULATED SUBSTANCES

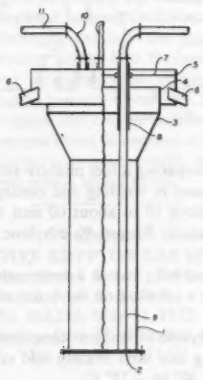
Georgi Alexandrov Haralampiev; Georgi Petrov Girdjev; Lyudmila Karlo Cheyka; Assen Parvanov Milenov, all of Sofia; Lyuben Rangelov Starev, Plovdiv; Georgi Ivanov Abrashev, Plovdiv, and Ivaylo Yanev Grigorov, Plovdiv, all of Bulgaria, assignors to Kzm "D. Blagoev", Plovdiv, Bulgaria

Filed Mar. 22, 1976, Ser. No. 669,069

Claims priority, application Bulgaria, Mar. 24, 1975, 29421

Int. Cl.[2] B01J *8/20;* **C22B** *3/02*

U.S. Cl. 23—283 **1 Claim**



1. A fluidized-bed reactor for carrying out chemical reactions between liquids and solid granulated substances, comprising a reaction cylinder having a flat bottom, and having a pressure pipe conduit for fluidizing liquid disposed therein, a transition zone, an upper cylinder and an overflow cylinder with overflow gutters positioned at the upper and outward position thereof, said reaction cylinder connected to said upper cylinder and said overflow cylinder by said transition zone a supporting frame positioned and fastened to the walls of said overflow cylinder guiding sleeves fastened to said supporting frame; vertically moveable pipes disposed inside said guiding sleeves and arranged to touch the bottom of said reaction cylinder at their outlet so as to form a seal against reverse flow, said vertically moveable pipes connected by means of flexible connectors to said pressure pipe conduit for the fluidizing liquid whereby upon introduction of said fluidizing liquid through said pressure pipe conduit, said flexible connectors, and said vertically moveable pipes, the pipes will lift to balance hydraulic forces allowing fluid to flow into said reaction cylinder, and whereby upon termination of liquid introduction said vertically moveable pipes will return to a sealing position against said bottom by force of gravity.

4,045,185

AUTOCLAVE

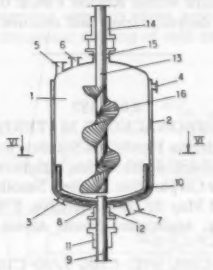
Michel Azemar, Soucieu-en-Jarrest, and Lucien Vigliecca, Venissieux, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 20, 1976, Ser. No. 734,084

Claims priority, application France, Oct. 21, 1975, 75.32124

Int. Cl.[2] B01J *3/00;* **B01F** *7/16*

U.S. Cl. 23—290 **11 Claims**



1. An autoclave for preparation in bulk of polymers and copolymers based on vinyl chloride comprising a vessel, at least one agitator mounted for rotational movement within said vessel consisting essentially of a ribbon wound in helicoidal turns on a substantially vertical rotatable shaft, the upper surface and the lower surface of said ribbon being respectively surfaces S_1 and S_2 each generated by displacement of a straight segment of a line of substantially constant length, when one of the ends describes a helix on a cylinder which forms a surface of the rotatable shaft, said segments being situated during their displacement in planes tangential to said cylinder, upper surface S_1 extending from the shaft at a negative angle ϕ_1 with the plane perpendicular to the axis of the rotatable shaft and the lower surface S_2 extending at a positive angle ϕ_2 with the plane perpendicular to the axis of the rotatable shaft.

4,045,186

METHOD FOR PRODUCING LARGE SOFT HEXAGONAL BORON NITRIDE PARTICLES

Francis R. Corrigan, Westerville, Ohio, assignor to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 622,822, Oct. 15, 1975, abandoned, which is a continuation of Ser. No. 394,635, Sept. 6, 1973, abandoned. This application Dec. 6, 1976, Ser. No. 747,845

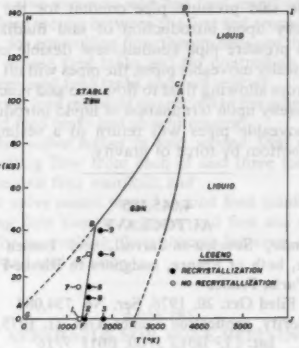
Int. Cl.[2] B01D *9/02;* **B01J** *17/04;* **C01B** *35/00, 21/06*

U.S. Cl. 23—295 R **7 Claims**

1. The method of producing soft hexagonal boron nitride crystals of larger than 50 microns average particle size which comprise the steps of:

a. mixing graphitic boron nitride particles (GBN) of less than 50 microns average particle size and lithium nitride, the boron nitride comprising 50 to 85 mole percent of the boron nitride-lithium nitride mixture,

b. simultaneously subjecting said mixture, and (d) separating the GBN crystals from the mixture to values of pressure



and temperature within Region FBCE of the Figure;
c. cooling and depressurizing said mixture.

4,045,187

CARBONACEOUS MATERIAL

Andries Brink; Adriaan Hendrikus Stander, and Leonard James Dry, all of Sasolburg, South Africa, assignors to South African Coal, Oil & Gas Corporation Limited, Sasolburg, South Africa

Filed May 20, 1975, Ser. No. 579,089
Claims priority, application South Africa, May 24, 1974, 74/3325
Int. Cl.² C10L *9/00*; C10G *1/00*; C10B *51/00*
U.S. Cl. 44—1 B **20 Claims**

1. A coking blend, which when subjected to conventional coking conditions is converted to a coke useful for metallurgical purposes, said blend consisting essentially of:

i. up to about 10% by weight of a carbonaceous material derived from solid carbonaceous fossil fuel, subjected to deoxygenation and dewatering in the presence of hydrogen and a solvent having hydrogen carrier properties which consists essentially of the combined, substantially non-volatile, substantially solid product and residues of said deoxygenation, including ash and carbonaceous insolubles, the material having a ring and ball softening point about 30° C, and

ii. the balance of said blend consisting of coal having coking properties inadequate for metallurgical purposes.

11. A process for the manufacture of coke useful for metallurgical purposes, which consists essentially of:

i. preparing a carbonaceous residue by subjecting a solid carbonaceous fossil fuel material of which the oxygen content is undersirably high for satisfactory coking properties to a step of deoxygenation and removal of such water as may be present, which step comprises heating the carbonaceous material in intimate contact with a liquid solvent and a hydrogen carrier and hydrogen under pressure to effect the deoxygenation, followed by distilling the solvent and such volatiles as are formed off the combined product of said heating, and recovering the combined residue,

ii. blending up to about 10% by weight of the carbonaceous material produced by step (i) with ordinary coal having coking properties unsatisfactory for metallurgical purposes, and

iii. subjecting the blend of step (ii) to conventional coking conditions and recovering the resulting coke as a product.

4,045,188

FUEL ADDITIVES FOR INTERNAL COMBUSTION ENGINES

Kenneth A. Hirschey, 6804 Southdale Road, Edina, Minn. 55435

Filed Dec. 29, 1975, Ser. No. 644,626
Int. Cl.² C10L *1/02*
U.S. Cl. 44—56 **3 Claims**

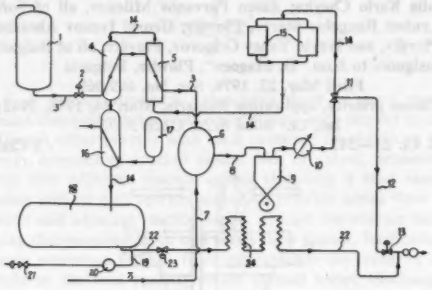
1. Hydrocarbon motor fuel for internal combustion engines and containing an additive therein consisting of an admixture of ditertiarybutyl peroxide and ditertiarybutyl alcohol on a basis of between about 1 part peroxide to about 20 parts ditertiarybutyl alcohol up to about 1 part ditertiarybutyl peroxide to about 1 part of ditertiarybutyl alcohol, with the ditertiarybutyl peroxide - ditertiarybutyl alcohol admixture being present in said fuel in an amount ranging from between about 0.1 ppm. to about 1 ppm. of the ditertiarybutyl peroxide component.

4,045,189

METHOD FOR PREPARING FUEL MIXTURES FOR TORCHES AND BURNERS

Maurice Bruni, Tremblay lesGonesses, and Georges Seris, Anthony, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude, Paris, France

Filed June 17, 1976, Ser. No. 697,259
Claims priority, application France, June 20, 1975, 75.19303
Int. Cl.² F17D *1/04*; C10L *3/02*
U.S. Cl. 48—190 **5 Claims**



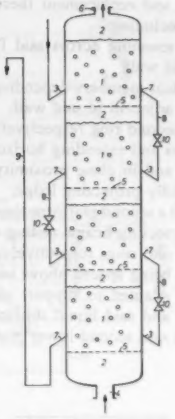
1. A method of preparing a fuel mixture suitable for torches and burners to be used in welding and cutting operations and comprising from about 10 to about 60 mol % acetylene and from about 40 to about 90 mol % ethylene, comprising the steps of

1. providing liquid ethylene at a temperature of −100° to −80° C and at a pressure on the order of about 1.4 to 3.4 bara;
2. providing acetylene at ambient temperature;
3. first vaporizing and then heating said ethylene to a temperature of − 30° to −25° C;
4. mixing said acetylene and said gaseous ethylene in desired proportions at a pressure very slightly above atmospheric and at a temperature in the range of −25° to +20° C;
5. compressing said mixture to a pressure of 2 to 5 bara;
6. distributing a first fraction of said compressed mixture at a pressure of 2 to 5 bara, and cooling and condensing said second fraction by passing the remaining second fraction in heat exchange relationship with said ethylene to effect said vaporizing and heating of said ethylene in step (3), and storing the resultant liquid mixture at 2 to 5 bara.

4,045,190
METHOD FOR REGULATING THE FLOW OF LIQUID THROUGH MASS TRANSFER COLUMNS

Artur Judat; Helmut Judat, both of Langenfeld, and Gerd Grah, Haan, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 6, 1974, Ser. No. 476,830
Claims priority, application Germany, June 19, 1973, 2331195
Int. Cl.[2] B01D *47/02*
U.S. Cl. 55—93 7 Claims



1. A method for regulating the heights of bubble layers in multistage mass-exchange columns with gas-distributor plates arranged at intervals above one another, in which the compartments each formed by two vertically adjacent gas-distributor plates communicate with one another through tubes which comprises throttling the flow of liquid through the tubes in response to the pressure difference between the gas cushions below the gas-distributor plates of two successive compartments.

5. An apparatus for bubbling a gas through a liquid comprising a vertically disposed housing enclosing a columnar space, means for introducing a gas into the bottom of the space, means for introducing liquid into the space above the gas introducing means, a plurality of vertically spaced plates which are pervious to gas and impervious to liquid separating the said columnar space into compartments, means for flowing liquid from one compartment to another comprising a throttle valve which is responsive to gas pressure, or to liquid height in a compartment into which liquid flows.

4,045,191
RADIOACTIVE KRYPTON GAS SEPARATION

Jay Robert Martin, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 252,219, May 11, 1972, Pat. No. 3,944,646.
This application June 23, 1975, Ser. No. 589,525
Int. Cl.[2] B01D *53/02*
U.S. Cl. 55—179 6 Claims

1. Apparatus for the separation of radioactive krypton from a feed gas mixture comprising nitrogen and trace amounts of carbon dioxide and said radioactive krypton comprising;

a. at least two crystalline zeolite molecular sieve adsorbent beds arranged in parallel flow relation;

b. means for providing said feed gas mixture at superatmospheric pressure and ambient temperature and sequentially introducing same to the inlet end of each of said adsorbent beds;

c. heat exchange means having first and second passageways and means for passing nonadsorbed prepurified gas from the discharge end of each of said adsorbent beds to said first passageway for cryogenic cooling therein;

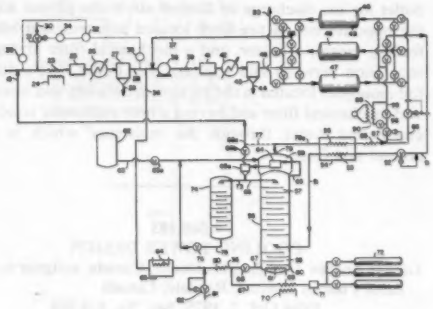
d. a distillation column comprising a top reflux condenser, a bottom kettle with heating means, and a multiplicity of spaced liquid-gas contact trays intermediate said top reflux condenser and said bottom kettle;

e. a liquid nitrogen supply and means for introducing same to the top reflux condenser;

f. conduit means for introducing the cryogenically cooled prepurified gas from said heat exchanger means to an intermediate tray section of said distillation column for mass and heat exchange with krypton-depleted condensate to form krypton-depleted vapor and krypton-enriched liquid;

g. a conduit means for passing said krypton-depleted vapor from the upper end of the distillation column intermediate tray section to said top reflux condenser for heat exchange with said liquid nitrogen supply to form nitrogen overhead gas and krypton-depleted condensate, and means for returning at least part of said krypton-depleted condensate to the upper end of said intermediate tray section;

h. conduit means for passing said nitrogen overhead gas to said second passageway of said heat exchanger means for partially rewarming same to about ambient temperature and for said cryogenic cooling of said prepurified gas;



i. other conduit and flow control means for sequentially passing a first part of the partially rewarmed nitrogen overhead gas at low pressure as cool purge gas to the feed discharge end of each of said adsorbent beds having previously been at least partially loaded with carbon dioxide and krypton from said feed gas mixture, for substantially complete desorption of only said krypton;

j. conduit means for returning the krypton-containing first part of cool purge gas from the adsorbent bed inlet end to the feed gas mixture providing means (b);

k. means for further warming a second part of said partially rewarmed nitrogen overhead gas as hot purge gas, and still other conduit and flow control means for sequentially passing same to the feed discharge end of each of said adsorbent beds having previously been at least partially loaded with carbon dioxide and krypton from said gas mixture and thereafter substantially completely desorbed of only said krypton, for desorption of the remaining carbon dioxide;

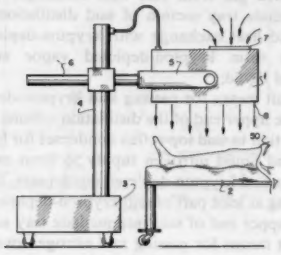
l. conduit means for discharging the carbon dioxide-containing hot purge gas from the adsorbent bed feed inlet end; and

m. conduit and flow control means for sequentially introducing a third part of said partially rewarmed nitrogen overhead gas to the feed discharge end of each of said adsorbent beds after the hot purge gas flow for recooling thereof.

4,045,192
MOBILE FILTERING APPARATUS FOR KEEPING PATIENTS UNDER ASEPTIC CONDITIONS

Wolfgang Eckstein, Sereetz, and Frank Benthin, Lubeck-Israelsdorf, both of Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Filed Aug. 25, 1976, Ser. No. 717,694
Claims priority, application Germany, Sept. 6, 1975, 2539743
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—222 9 Claims

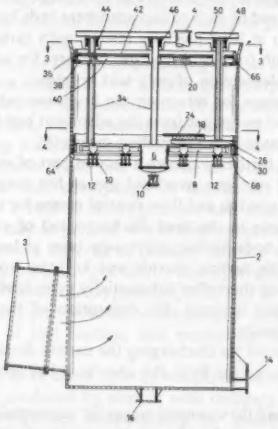


1. A mobile air filtering apparatus for keeping patients in hospital rooms under aseptic conditions, comprises a housing having an inlet for the inflow of air adjacent one end and an outlet for the discharge of filtered air to the patient adjacent the opposite end, a pre-filter located adjacent said inlet, air feeding means, a heater, and a mechanical filter arranged in succession between said inlet and said outlet, and a diffusion foil moistener located in the air stream between said heater and said mechanical filter and having a heat exchanger conduit for conducting water through the moistener which is coiled around said filter.

4,045,193
COOLING TOWER DESIGN

George Andrew Halliday, Etobicoke, Canada, assignor to Fabricated Plastics Limited, Rexdale, Canada

Filed Oct. 2, 1975, Ser. No. 618,965
Claims priority, application Canada, Sept. 15, 1975, 235467
Int. Cl.[2] B01D *47/06*
U.S. Cl. 55—257 PV 8 Claims



5. A cooling tower for cooling liquid by counter-current flow through a rising flow of air comprising:

an upright surrounding wall having an upper end, and defining a flue adapted to contain said counter-current flow of liquid and air;

conduit means adapted to distribute said liquid to substantially the entire area of said flue and having outlet ports at spaced intervals adapted to disperse said liquid into said air flow;

demister means disposed across the flue in the path of said air flow and adapted to remove vapour therefrom;

support means adapted to support said liquid conduit means and said demister means in said tower and adapted to permit removal and replacement thereof as a unit; said support means including:

horizontal beams spanning across said flue to rest on the upper end of said wall;

a plurality of vertical members depending from said beams within said flue adjacent to said wall;

a first ring and a second ring respectively mounted on said vertical members and extending horizontally around said flue parallel to and in close proximity to said wall and having an inwardly projecting ledge;

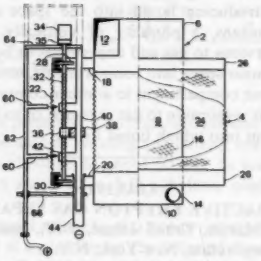
a first platform and a second platform respectively formed of a lattice of intersecting beams resting at their outer ends on the ledge of said rings respectively;

said first platform being spaced above said second platform and being thus adapted to support said demister means resting thereon and said liquid distribution means being suspended from said second lower platform.

4,045,194
APPARATUS FOR CLEANING AIR

Johann Walter Ferri, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Sept. 13, 1976, Ser. No. 722,889
Claims priority, application Switzerland, Sept. 23, 1976, 12331/76
Int. Cl.[2] B01D *46/38*
U.S. Cl. 55—290 7 Claims



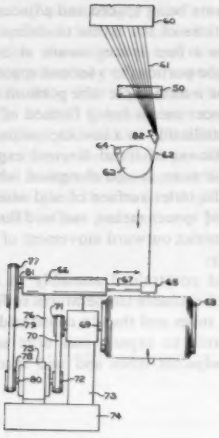
1. An apparatus for cleaning air charged with contaminants, especially fibers and dust, comprising a pre-separator, a dust filter cooperating with the pre-separator, said dust filter comprising a rotatable filter drum having a substantially cylindrical filter body possessing a filter, at least one movable suction nozzle effective at the filter of the dust filter, said pre-separator comprising a body of rotation having an inlet portion structured for generating a spin flow and a jacekt portion structured as a sieve surface, said filter drum surrounding the jacket portion of the pre-separator, said filter having an inner surface, the movable suction nozzle being operatively associated with the inner surface of the filter, and drive means operatively connected with the suction nozzle and the filter drum.

4,045,195

METHOD OF PREPARING GLASS STRAND AND NOVEL GLASS STRAND PACKAGES

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 3, 1975, Ser. No. 637,344
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **12 Claims**



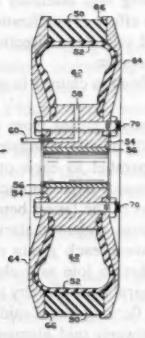
1. A method of winding glass strand comprising drawing a plurality of glass filaments from a molten glass feeding means, gathering said filaments into a strand, passing the strand so formed through a tension reducing zone to reduce tension thereon, passing the strand through a fluid turbulence means wherein a gaseous fluid is introduced perpendicular to the path of strand travel and tangential to the curved wall of the means to thereby microtraverse the strand and also produce a rounded strand and winding the strand on winding surface as it emerges from said fluid turbulence means at a high speed and in traversing relation to the winding surface.

4,045,196

METHOD AND APPARATUS FOR CHOPPING GLASS STRANDS

William L. Schaefer, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 6, 1976, Ser. No. 730,103
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **14 Claims**



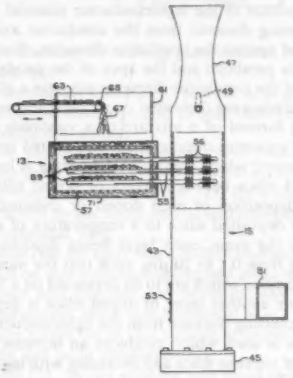
9. In a method of chopping glass fiber strands comprising passing the strands between a first wheel having an annular cutting surface and a second wheel having a plurality of cutting blades on the periphery thereof, whereby said strand is chopped between said cutting blades and said cutting surface, the improvement comprising providing a fluid expandable core member surrounded by said annular cutting surface and expanding a peripheral surface of said core member under fluid pressure to firmly conform to the inner diameter of said annular cutting surface and to provide a proper mesh between said cutting surface and said blades.

4,045,197

GLASSMAKING FURNACE EMPLOYING HEAT PIPES FOR PREHEATING GLASS BATCH

Yih-Wan Tsai, Pittsburgh; John E. Sensi, Arnold, and Vincent I. Henry, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 8, 1976, Ser. No. 721,244
Int. Cl.² C03B *1/00*
U.S. Cl. 65—27 **7 Claims**



1. In a method of melting glass batch materials in a combustion-heated, continuous, glass melting furnace to yield glass and combustion exhaust gases, wherein batch materials are continuously fed to the furnace and molten glass discharged therefrom and wherein the exhaust gases are employed to preheat batch materials prior to feeding them to the furnace, the improvement which comprises

isolating the batch materials during preheating from the exhaust gases

transferring heat from the exhaust gases to the batch materials through at least one heat pipe wherein a heat pipe working fluid is vaporized by heat of the exhaust gases and then condensed by giving up heat to the batch materials.

4. In a glassmaking apparatus comprising a combustion-heated, glass melting furnace, means for exhausting combustion gases, means for feeding glass batch materials to the furnace and means for discharging glass from the furnace, wherein means are provided for heating glass batch materials prior to feeding them to the furnace using heat from the combustion gases being exhausted from the furnace, the improvement which comprises

an enclosure surrounding said glass batch feeding means isolated from said combustion gas exhaust means, and

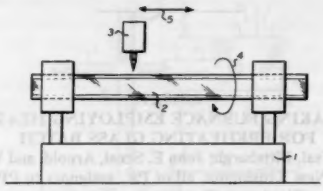
at least one heat pipe extending at one end into said combustion gas exhaust means and extending at its other end into said batch feeding means enclosure.

4,045,198

METHOD OF PREPARING A FOREPRODUCT FOR THE PRODUCTION OF AN OPTICAL LIGHTCONDUCTOR

Karlheinz Rau, Hanau; Albert Muhlich, Frankfurt; Fritz Simmat, Gelnhausen, and Norbert Treber, Kriftel, all of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Germany

Filed Aug. 24, 1976, Ser. No. 717,075
Claims priority, application Germany, Aug. 28, 1975, 2538313
Int. Cl.[2] C03C *17/00;* G02B *5/14*
U.S. Cl. 65—33 15 Claims



1. In a process for preparing a foreproduct useful in the production of an optical, self-focusing lightconductor in which the index of refraction of the lightconductor material diminishes with increasing distance from the conductor axis such that, when plotted against the conductor diameter, the refractive index curve is parabolic and the apex of the parabola lies over the center of the conductor diameter wherein a plurality of layers of doped silica are deposited on a cylindrical support, said layers being formed of a mixture of a vaporous silicon compound and a vaporous doping agent at elevated temperature, the improvement which comprises depositing at least one layer of undoped silica between layers of doped silica and following each deposition of each doped or undoped silica layer heating the deposited silica to a temperature of at least 900° C to vitrify the same, each layer being deposited in a thickness ranging from 0.1 to 20 μm, such that the number of layers of undoped silica which are to be deposited on a layer of doped silica before another layer of doped silica is deposited increases with increasing distance from the lightconductor axis if a doping agent is used which produces an increase in the refractive index of vitreous silica and decreases with increasing distance from the lightconductor axis if a doping agent is used which produces a decrease in the refractive index of vitreous silica.

4,045,199

METHOD OF MAKING A RECUPERATOR STRUCTURE BY CRYSTALLIZATION

Donald F. Mold, and Ronald G. Rice, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 554,791, March 3, 1975. This application May 12, 1976, Ser. No. 685,555
Int. Cl.[2] C03B *32/00;* B21D *50/00;* C03C *23/20*
U.S. Cl. 65—33 15 Claims

1. A method for making a recuperator heat exchange assembly having plural strata of parallel flow fluid passages therein, comprising

a. forming a multiplicity of elongated tubes of a glass that is thermally crystallizable to a low expansion glass ceramic having a coefficient of lineal thermal expansion of about -18 to $+50 \times 10^{-7}$/° C over the range of 0° - 300° C;

b. each of said tubes being sealed at each end and containing an expansible fluid medium, each of said tubes having a portion intermediate the ends thereof which is substantially straight;

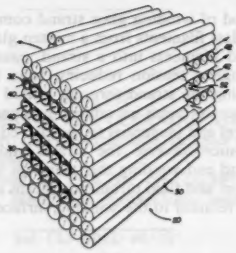
c. tightly packing pluralities of said tubes into a plurality of layers of tubes with the axes of the intermediate portion of the tubes in each layer essentially parallel to each other;

d. arranging said pluralities of layers with the intermediate tube portions thereof in a stacked array with respect to each other and with the axes of the intermediate portions of the tubes in each layer being essentially parallel to the axes of corresponding intermediate tube portions in the other layers;

e. spacing each layer of tubes from at least one of the adjacent layers in said array by interposing spacer means between each of the ends of the layers being spaced, each of said spacer means extending transversely across the tubes in the layers being spaced and adjacent the intermediate tube portions of the layers to define a passageway extending from a first spacer means at one end of the intermediate tube portions to a second spacer means at the other end of the intermediate tube portions of spaced tube layers, said spacer means being formed of a glass that is thermally crystallizable to a low expansion glass ceramic having a coefficient of lineal thermal expansion that is substantially the same as said elongated tubes;

g. constraining the outer surface of said assembly of elongated tubes, said spacer means, and said fluid flow directing means to restrict outward movement of those portions of the assembly;

h. subjecting said constrained assembly to an initial heat treatment which includes temperatures sufficient to soften said elongated tubes and thus to cause said fluid medium entrapped therein to expand and urge said tubes into contact with adjacent tubes and said spacer means and



said flow directing means to fuse said assembly portions into an integral mass;

i. opening the sealed ends of said elongated tubes to enable reception and discharge of a fluid to obtain a heat exchange between fluid flowing in said passageways, and

j. further heat treating said assembly to elevated temperatures sufficient to effect crystallization of said tubes, said spacer means and said flow directing means into a low expansion glass-ceramic.

12. A method as defined in claim 1 in which said layer spacing step includes

a. forming each spacing means from a plurality of tightly packed individually axially elongated elements arranged with their axes parallel to each other and disposing a group of such elements adjacent each end of the intermediate tube portions of the layers being spaced, and

b. interposing ceramic sealant material between adjacent elements and between each group of elements and adjacent layers of tubes to join said elements and said tube layers into an integral mass thereby preventing a fluid in a passageway from flowing out of said passageway through the interstices between said elements and between said tubes in said layers, said ceramic sealant material being selected from the group consisting of a ceramic cement, foamable ceramic cement and sinterable, thermally crystallizable glass frit.

4,045,200

METHOD OF FORMING GLASS SUBSTRATES WITH PRE-ATTACHED SEALING MEDIA

Charles W. Salisbury, Risingsun, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 2, 1975, Ser. No. 537,897
Int. Cl.[2] C03C *27/00*
U.S. Cl. 65—42 3 Claims

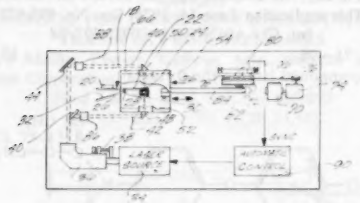
1. A method of producing a glass substrate with electrical conductors deposited thereon suitable for gas panel fabrication which comprises drawing a vitreous or crystallizing solder glass consisting essentially of, on a weight basis, 72% PbO, 15% B_2O_3, 4% SiO_2, 5% Al_2O_3 and 4% ZnO and having a softening point of 811° F into at least one rod 3 - 40 mils in diameter, applying said rod to one surface of said substrate adjacent the periphery thereof, and pre-firing said substrate for a period of time and at a temperature sufficient to permanently attach the solder glass thereto in a highly sintered or glassy state which will reflow and seal at a predetermined sealing temperature.

4,045,201

METHOD AND APPARATUS FOR SUBDIVIDING A GAS FILLED GLASS TUBE

Thomas E. Caffarella; George J. Radda, and David J. Watts, all of Tucson, Ariz., assignors to American Atomics Corporation, Tucson, Ariz.

Filed July 9, 1976, Ser. No. 703,809
Int. Cl.[2] C03B *33/08*
U.S. Cl. 65—105 13 Claims



1. Apparatus for subdividing a gas filled glass tube into individual sealed sections comprising means for supporting a tube in fixed position, means including a laser light beam source for directing a focused laser beam at the tube, means for repeatedly scanning the beam back and forth across the width of the tube along the same path in a direction perpendicular to the longitudinal axis of the tube to heat the wall of the tube to a temperature at which the glass softens, and means for maintaining the gas pressure higher on the outside of the tube than on the inside of the tube causing the softened portion of the tube to collapse.

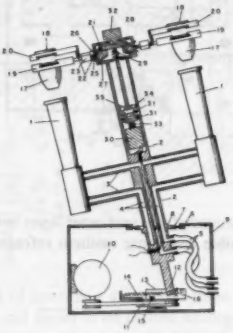
4. A method of dividing a sealed gas-filled glass tube into sealed segments comprising: directing laser beams simultaneously at the tube from at least two directions at a position along the length of the tube, and scanning the beam across the width of the tube while holding the tube stationary in an ambient atmosphere having a higher pressure than the gas in the tube to heat the entire perimeter of the tube until the tube softens and collapses to form sealed segments.

4,045,202

FUSION AND CASTING MACHINE

Fernand Claisse, 230 Boul. Monaco, Quebec, Quebec, Canada (GIP 3H2)

Filed May 7, 1975, Ser. No. 575,475
Claims priority, application Canada, Sept. 9, 1974, 208712
Int. Cl.[2] C03B *5/18, 9/00;* F27B *14/02*
U.S. Cl. 65—178 6 Claims



1. A machine for making glass buttons, comprising:
a base (**9**);
an upstanding column (**2**) pivoted at a pivot joint (**6, 7, 8**) adjacent its lower end to said base for universal lateral tilting movement;
drive means (**11**) below said pivot joint for swinging the lower end of said column in substantially circular motion;
a normally upright crucible (**17**) for a charge to be melted carried by the upper end of said column for tilting about a horizontal axis;
a mold (**18**) for receiving a molten charge and means (**20** and **22**) on said column holding said mold in inverted position over said crucible and mounting said mold for pivotal movement about said horizontal axis;
heater means (**1**) on said column arranged to heat said crucible and mold simultaneously;
means (**21, 28**) for rotating said mold about said horizontal axis and lost motion means (**43**) between said crucible and mold for tilting said crucible about said horizontal axis after a predetermined degree of tilt of said mold; and
means (**14**) for rendering said drive means inoperative when said mold and crucible are being rotated about their respective axes.

4,045,203

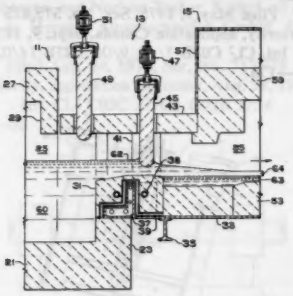
COMPOSITE SEAL FOR A GLASS FORMING CHAMBER

Mahesh C. Bhardwaj, Sarver, and William J. Englert, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1976, Ser. No. 670,598
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—182 R 10 Claims

1. In an apparatus for making flat glass comprising a glass furnace connected to a forming chamber through a molten glass delivery facility wherein the forming chamber includes an impervious metal casing having an inner refractory liner containing a pool of molten metal for supporting glass during forming and the delivery facility includes a refractory support mounted at least partially inside the casing for supporting molten glass during its delivery to the forming chamber, the improvement which comprises:
a substantially impervious, flexible and compressible composite layered seal disposed between the refractory support and the casing, said composite layered seal comprising a pair of outer layers and an inner layer therebetween each of said layers having a surface in coextensive contact

with that of an adjacent layer, said outer layers being composed of a flexible and substantially impervious dense



refractory material and said inner layer being composed of a compressible less dense resilient refractory material.

4,045,204

FERTILIZER COMPOSITION

Hiroomi Matsunaga, Kobe; Sigel Fujimura, Nishinomiya; Hisao Namioka, Niihama; Kozo Tsuji, and Masashi Watanabe, both of Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., both of Japan

Filed Feb. 24, 1976, Ser. No. 660,871

Claims priority, application Japan, Feb. 24, 1975, 50-23310; Feb. 24, 1975, 50-23311

Int. Cl.² C05F *11/08*

U.S. Cl. 71—11 **34 Claims**

1. A fertilizer composition comprising a fertilizer or a fertilizing substance and pullulane or a derivative thereof.

4,045,205

METHOD FOR THE MANUFACTURE OF SOIL MODIFIERS FROM WASTE MATERIAL OF THE MANUFACTURE OF TITANIUM DIOXIDE

Luigi Piccolo, Milan; Gabriele Bottai, Venegono Inferiore (Varese); Antonio Paolinelli, Milan, and Angelo La Rovere, Rovereto (Trento), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed July 7, 1976, Ser. No. 703,144

Claims priority, application Italy, July 8, 1975, 25180/75

Int. Cl.² C05D *9/00*

U.S. Cl. 71—31 **7 Claims**

1. A method for preparing a compact soil modifier comprising from 80 to 95% by weight of a mixture of ferric oxide and ferric sulphate in an oxide/sulphate weight ratio of from 0.2:1 to 2:1, which comprises calcining at a temperature of from 500° to 600° C, in the presence of an oxidizing gas, a material comprising as a main component hydrated ferrous sulphate with an average number of molecules of crystallization of from 1 to 5, for a period sufficient to convert from 80 to 95% by weight of said hydrated sulphate into ferric oxide and ferric sulphate, said material being obtained by the partial dehydration of a waste material consisting essentially of ferrous sulphate heptahydrate obtained in the manufacture of titanium dioxide from ilmenites or ilmenite slags by the sulphate process.

4,045,206

SYNERGISTIC HERBICIDAL COMPOSITION COMPRISING N-(BUTOXYMETHYL)-6'-TERT-BUTYL-2-CHLORO-o-ACETOTOLUIDIDE AND METHABENZTHIAZURON

Bernard Convent, Leernes, Belgium, assignor to Monsanto Company, St. Souis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,569

Int. Cl.² A01N *9/12, 9/20, 9/02*

U.S. Cl. 71—90 **8 Claims**

1. A herbicidal composition consisting essentially of a a herbicidally effective amount of a mixture of (a) N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and (b) N-(2-benzthiazolyl-N,N'-dimethylurea wherein the ratio of (a) to (b) is within the range of from about 1:8 to 4:1 and an inert carrier therefor.

4,045,207

SYNERGISTIC HERBICIDAL COMPOSITION COMPRISING N-(BUTOXYMETHYL)-6'-TERT-BUTYL-2-CHLORO-o-ACETOTOLUIDIDE AND PYRAZON

Bernard Convent, Leernes, Belgium, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,708

Int. Cl.² A01N *9/22, 9/20, 9/02*

U.S. Cl. 71—92 **7 Claims**

1. A herbicidal composition consisting essentially of a herbicidally effective amount of a mixture of (a) N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and (b) 5-amino-4-chloro-2-phenyl-3(2H)-pyridazinone wherein the ratio of (a) to (b) is within the range of from about 1:8 to 4:1 and an inert carrier therefore.

4,045,208

DIPHENYL ETHER AMIDES

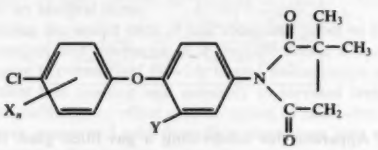
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 598,486, July 23, 1975, Pat. No. 3,976,470. This application June 14, 1976, Ser. No. 695,672

Int. Cl.² A01N *9/22; C07D 207/04*

U.S. Cl. 71—95 **15 Claims**

1. A compound having the formula



in which X is chloro or methyl; *n* is 0, 1 or 2; and Y is chloro or trifluoromethyl.

4,045,209

SUBSTITUTED UREAS AS HERBICIDES

Daniel Hainaut, Villemomble; Jean-Pierre Demoute, Montreuil-Sous-Bois, and Andre Teche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

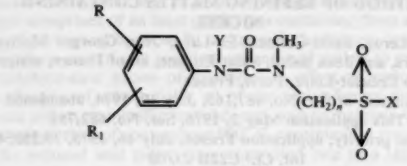
Continuation-in-part of Ser. No. 582,877, June 2, 1975, abandoned, which is a continuation of Ser. No. 305,336, Nov. 10, 1972, abandoned. This application Sept. 22, 1975, Ser. No. 615,401

Claims priority, application France, Nov. 17, 1971, 71.41102

Int. Cl.² A01N *9/12; C07C 119/00*

U.S. Cl. 71—98 **12 Claims**

1. A urea of the formula



wherein R and R_1 are individually selected from the group consisting of hydrogen, chlorine, bromine, trifluoromethyl, lower alkyl of 1 to 6 carbon atoms and lower alkoxy of 1 to 6 carbon atoms, *n* is 0, X is lower alkyl of 1 to 6 carbon atoms optionally substituted with a halogen, Y is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and the dotted lines indicate that the compound may contain no oxygen bound to the sulfur atom or may be in sulfoxide or sulfonyl form.

10. A herbicidal composition comprising an effective amount of a compound of claim **1** and an inert carrier.

4,045,210

SYNERGISTIC HERBICIDAL COMPOSITION COMPRISING N-(BUTOXYMETHYL)-6'-TERT-BUTYL-2-CHLORO-o-ACETOTOLUIDIDE AND N-(3-CHLORO-4-METHYL PHENYL)-N',N'-DIMETHYLUREA

Bernard Convent, Leernes, Belgium, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,566
Int. Cl.[2] A01N *9/20, 9/02*
U.S. Cl. 71—120 **8 Claims**

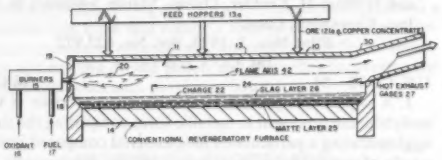
1. A herbicidal composition consisting essentially of herbicidally effective amount of a mixture of (a) N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and (b) N-(3-chloro-4-methyl phenyl)-N',N'-dimethylurea in a weight ratio of (a) to (b) within the range of 1:8 to 8:1 and an inert carrier therefor.

4,045,211

METHOD FOR INCREASING RADIANT HEAT TRANSFER FROM HOT GASES

Richard Mather Powers, Guthrie, Ariz., assignor to Phelps Dodge Corporation, New York, N.Y.

Filed Jan. 20, 1976, Ser. No. 650,809
Int. Cl.[2] C21B *5/02;* **C22B** *15/00*
U.S. Cl. 75—21 **4 Claims**



1. In a method for operating a reverberatory furnace wherein a gaseous fuel is combusted to produce a flame, and wherein a furnace charge of metallic ore is heated by radiation from the furnace hot gases, the improvement which comprises:

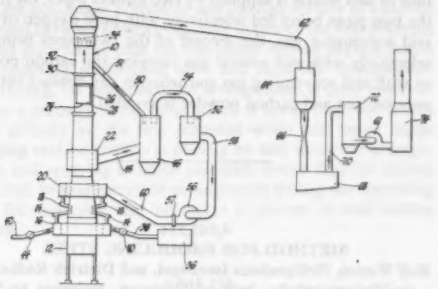
introducing to the furnace separate from said furnace fuel, at one or more locations downstream of said flame which are spaced from said charge but below the axis of the flame, and at an aggregate rate from all locations of about 1 to 10% the rate of gaseous fuel, an unsaturated gaseous hydrocarbon having a carbon to hydrogen weight ratio of at least about 6 which exothermically cracks inside said furnace to yield hydrogen and carbon particles in said hot gases, whereby radiant heat transfer from said gases to the charge is increased.

4,045,212

METHOD OF OPERATION OF A CUPOLA

Isidore Hodes, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1976, Ser. No. 658,477
Int. Cl.[2] C21B *11/00*
U.S. Cl. 75—40 **5 Claims**



1. A method of operating a cupola system having alternate layers of coke and metal to be melted arranged in a stack and having a combustion zone near the bottom of the stack and progressively upward along the stack a reducing zone, a melting zone and a preheat zone, comprising

continuously introducing substantially pure oxygen into said combustion zone and continuously recycling a fraction of the cupola gas from said preheat zone to said combustion zone and exhausting from said cupola system the remaining fraction of said cupola gas,

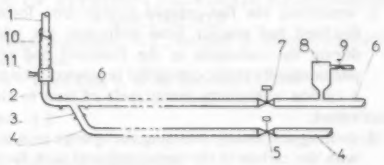
the rate of oxygen flow into said combustion zone and the fraction of cupola gas exhausted being balanced so that the amount of said pure oxygen introduced into said combustion zone is substantially equal to the amount of the oxygen in said remaining fraction, said pure oxygen being the only gas fed into said cupola system after the system is started in operation.

4,045,213

METHOD OF INJECTING A POWDER CONTAINING CARBON INTO A METAL BATH

Pierre Leroy, Saint-Germain-En-Laye; Jean Bastien, L'Etrat; Jean-Claude Muller, and Roger Kieger, both of Guenange, all of France, assignors to Creusot-Loire and Societe Lorraine de Laminage Continu-Sollac, both of Paris, France

Continuation of Ser. No. 634,466, Nov. 24, 1975, abandoned.
This application Jan. 27, 1977, Ser. No. 762,944
Claims priority, application France, Nov. 28, 1974, 74.38955
Int. Cl.[2] C21C *7/00*
U.S. Cl. 75—48 **7 Claims**



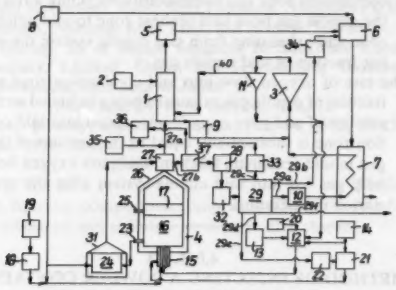
1. A method of deoxidizing or carburizing a ferrous metal bath by injecting into the bath a carbon powder by means of at least one immersed nozzle consisting of two concentric tubes, the method comprising feeding the central tube of said nozzle successively with pure oxygen during the oxidation phase or phases, then with a scavenging gas, selected from the group consisting of nitrogen, argon and carbon dioxide and then with

a neutral gas carrying said carbon powder during the deoxidation or carburization phase or phases, and finally with said scavenging gas before repeating the cycle, while feeding said peripheral tube successively with a fluid protecting said nozzle against wear during the oxidation phase or phases, and with this same fluid or another protective fluid during the deoxidation or carburization phase or phases and wherein the central tube of said nozzle is supplied by two distinct pipes, the first of the two pipes being fed selectively with pure oxygen or with said scavenging gas, the second of the two pipes being fed selectively with said neutral gas carrying the carbon powder or with said scavenging gas and wherein any contact between pure oxygen and carbon powder is avoided.

4,045,214
METHOD FOR PRODUCING STEEL

Rolf Wetzel, Heiligenhaus-Isenbugel, and Dietrich Radke, Essen-Margaretenhohe, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Jan. 14, 1975, Ser. No. 540,957
Claims priority, application Germany, Jan. 16, 1974, 2401909
Int. Cl.[2] C21B *13/14*
U.S. Cl. 75—60 **16 Claims**



1. Method for producing steel from fine-grained iron ores, comprising the steps of:

a. preheating and partially reducing the fine-grained iron ores in a countercurrent heat exchanger;

b. reducing the preheated and partially reduced fine-grained iron ores to fine-grained sponge iron in a fluidized bed reactor with exhaust gas which consists essentially of carbon monoxide and which emanates from a melting vessel in which sponge iron is melted;

c. separating the fine-grained sponge iron formed in the fluidized bed reactor from reduction gas which forms during the reduction in the fluidized bed reactor and pneumatically transporting the separated sponge iron into a carbon containing metal melt of iron in the melting vessel;

d. melting and finally reducing the sponge iron in the metal with the carbon in the metal melt and with further carbonaceous material which is pneumatically introduced into the metal melt;

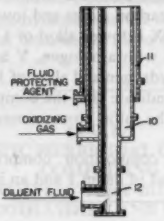
e. refining the metal melt with pure oxygen; and

f. introducing the oxygen, the carbonaceous material, and the sponge iron into the metal melt through at least one nozzle which is disposed below the surface of the metal melt, said oxygen, fine-grained sponge iron and carbonaceous material being introduced into the metal in immediate proximity to one another.

4,045,215
METHOD OF REFINING MATTES CONTAINING NICKEL

Pierre Leroy, Saint-Germain-En-Laye; Jean Georges Morlet, Nevers, and Jean Saleil, Saint-Etienne, all of France, assignors to Creusot-Loire, Paris, France

Continuation of Ser. No. 487,165, July 10, 1974, abandoned.
This application May 3, 1976, Ser. No. 682,751
Claims priority, application France, July 16, 1973, 73.25954
Int. Cl.[2] C22B *23/00*
U.S. Cl. 75—82 **15 Claims**



1. A method of refining a molten nickel-containing matte containing in excess of 7% sulphur to remove sulphur therefrom without excessive oxidation of the nickel, comprising in a first oxidative refining stage the step of blowing an oxidizing gas from at least one tuyere into the molten matte below the surface thereof to lower the sulphur content thereof, and when the sulphur content of the matte is from 4 to 7% in at least one subsequent oxidative refining stage producing nickel with a low sulphur content including continuing the blowing of said oxidizing gas into the matte, below the surface thereof, together with an added diluent fluid for sulphur dioxide which dilutes the sulphur dioxide gas formed in the matte during refining, said oxygen and diluent fluid being blown into the matte as an inner flow from at least one tuyere, and passing a fluid tuyere protective agent separate from said diluent fluid into the matte from said tuyere peripherally around the inner oxidizing gas and diluent fluid flow, said protective agent protecting the tuyere against wear.

4,045,216
DIRECT REDUCTION OF MOLYBDENUM OXIDE TO SUBSTANTIALLY METALLIC MOLYBDENUM

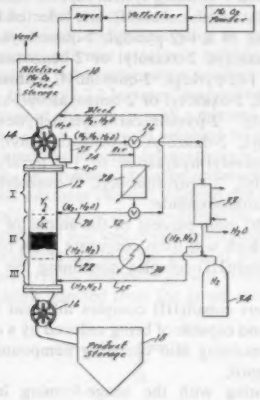
Harry W. Meyer, deceased, late of Weston, Conn., by Elizabeth Jane Meyer, executrix; Jerry D. Baker, Ann Arbor, Mich., and William H. Ceckler, Orono, Maine, assignors to Amax Inc., Greenwich, Conn.

Filed Nov. 3, 1975, Ser. No. 627,972
Int. Cl.[2] C22B *34/34*
U.S. Cl. 75—84 **26 Claims**

1. A continuous process for producing a product in which molybdenum is present in metallic form comprising the steps of agglomerating a particulated feed material composed predominantly of molybdenum trioxide into pellets, continuously introducing said pellets at a controlled rate into a reaction chamber defining a first reaction zone, heating said pellets to a first reaction temperature range of from about 580° C up to about 650° C in the presence of a first reaction gas comprised of an inert carrier gas containing from about 3 mol percent up to about 10 mol percent hydrogen, controlling the flow rate of said first reaction gas and said pellets to provide a stoichiometric excess of hydrogen in an amount greater than 1:1 up to about 10:1 mols hydrogen per mol molybdenum trioxide to effect an exothermic reduction of substantially all of the molybdenum trioxide in said pellets to molybdenum dioxide and to maintain the temperature of said pellets by substantially adiabatic means within said first reaction temperature range, continuously transferring the partially reduced said pellets at a controlled rate from said first reaction zone into a second

reaction zone, heating said pellets to a second reaction temperature above about 900° C in the presence of a second reaction gas comprised of an inert carrier gas containing from about 20 mol percent up to about 80 mol percent hydrogen, controlling the flow rate of said reaction gas and said pellets to provide a stoichiometric excess of hydrogen to effect an endothermic reduction of substantially all of the molybdenum dioxide in said pellets to metallic molybdenum and to maintain the temperature thereof above about 900° C, continuously transferring the reduced said pellets at a controlled rate to a third zone containing a protective nonoxidizing atmosphere to effect a stabilization and cooling of said pellets and thereafter recovering the pelletized metallic molybdenum product.

18. A continuous process for producing molybdenum dioxide comprising the steps of agglomerating a particulated feed material composed predominantly of molybdenum trioxide into pellets, continuously introducing said pellets at a controlled rate into a reaction chamber defining a reaction zone, heating said pellets to a reaction temperature range of from about 580° C up to about 650° C in the presence of a reaction gas comprised of an inert carrier gas containing from about 3 mol percent up to about 10 mol percent hydrogen, controlling the flow rate of said reaction gas and said pellets to provide a stoichiometric excess of hydrogen in an amount greater than 1:1 up to about 10:1 mols hydrogen per mol molybdenum trioxide to effect an exothermic reduction of substantially all of the molybdenum trioxide in said pellets to molybdenum dioxide and to maintain the temperature of said pellets by substantially adiabatic means within said reaction temperature range, continuously transferring the partially reduced said pellets at a controlled rate from said reaction zone to a cooling zone containing a protective nonoxidizing atmosphere to effect a stabilization and cooling of said pellets and thereafter recovering the pelletized molybdenum dioxide product.



4,045,217

DEVELOPING PROCESS FOR ELECTROPHOTOGRAPHY

Itaru Fujimura, Zushi, and Katutoshi Endo, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Dec. 23, 1975, Ser. No. 643,817
Claims priority, application Japan, Dec. 24, 1974, 50-3295
Int. Cl.² G03G *15/00*
U.S. Cl. 96—1 LY **8 Claims**

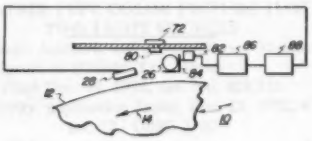
1. A developing process, for use in an electrophotographic copying machine of the wet developing type and which includes means providing an endless photosensitive surface cyclically movable along a predetermined endless path, and means disposed along the path for sequentially uniformly charging a portion of the photosensitive surface to a first potential, exposing the charged surface portion to an optical image to form an electrostatic latent image thereon, developing the latent image with a developing solution, having a toner dispersed therein of a charge opposite in polarity to the first potential, in a developing electrode arrangement maintained in opposing relation with the moving surface, removing any excessive solution from the moving surface, transferring the developed image onto copy sheets, cleaning the photosensitive surface, and eliminating any residual charge on the photosensitive surface, said process comprising the steps of charging at least the non-image portion of said moving surface to a second potential having a polarity opposite to that of the first potential at least prior to the time the non-image surface portion comes into opposing relationship with said electrode arrangement; maintaining, on said electrode arrangement, a third potential below a predetermined value which is lower than, and of the same polarity as, the first potential while said latent image carrying surface portion is passing by said electrode arrangement; and applying a fourth potential, lower than the second potential, to said electrode arrangement during the remaining time for one cycle that no image is present on said endless surface.

4,045,218

METHOD FOR ELECTRONSTATICALLY PRODUCING A COLOR ACCENTED PHOTOCOPY

James H. McVeigh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 456,090, March 29, 1974, Pat. No. 3,914,043. This application June 30, 1975, Ser. No. 591,583
Int. Cl.² G03G *5/12*
U.S. Cl. 96—1.2 **4 Claims**



1. A method of forming a copy of an original document with portions of the copy being highlighted in at least one color other than the remainder thereof, including the steps of:

positioning the original document on a substantially transparent support member;

adjusting an indicator movably mounted on the support member to select the portions of the original document being reproduced in at least a first color with the remainder thereof to be reproduced in a second color; and

reproducing the original document so that the copy has the selected portions in at least the first color with the remainder thereof in the second color.

4,045,219

METHOD OF REPRODUCING COLOR HIGHLIGHTED DOCUMENTS

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 7, 1976, Ser. No. 647,288
Int. Cl.² G03G *5/12, 13/01*
U.S. Cl. 96—1.2 **5 Claims**

1. A method of reproducing a color highlighted original document, including the steps of:

charging a photoconductive surface having an electrically insulating overcoating to a substantially uniform level;

projecting successive single color light images into the charged portion of the photoconductive surface, in superimposed registration with one another, to record a first electrostatic latent image on the overcoated photoconductive surface;

developing the first latent image recorded on the overcoated photoconductive surface with black particles;

transferring the black particles from the latent image to a sheet of support material;
charging the overcoated photoconductive surface to a substantially uniform level having a first polarity;
projecting a single color light image onto the charged portion of the overcoated photoconductive surface;
charging the portion of the overcoated photoconductive surface having the single color light image projected thereon to a substantially uniform level having a second polarity opposite to the charge of the first polarity;
projecting a light image of the original document onto the charged portion of the overcoated photoconductive surface;
applying an alternating charge to the portion of the overcoated photoconductive surface having the light image of the original document projected thereon;
illuminating uniformly the overcoated photoconductive surface to record a second electrostatic latent image corresponding to one of the colored regions of the original document;
developing the second latent image recorded on the overcoated photoconductive surface with particles corresponding in color to the color of the single color light image; and
transferring the colored particles to the sheet of support material having the black particles thereon.

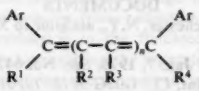
4,045,220

LOW COLOR PHOTOCONDUCTIVE INSULATING COMPOSITIONS COMPRISING NITROGEN-FREE PHOTOCONDUCTOR AND BENZOPYRILIUM SENSITIZER

Lawrence E. Contois, Webster; Charles J. Fox, and Richard W. Stahr, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 14, 1975, Ser. No. 595,990
Int. Cl.² G03G 5/09
U.S. Cl. 96—1.6 **28 Claims**

1. A coloration resistant photoconductive insulating composition comprising (1) an organic polymeric binder, (2) a nitrogen-free photoconductor of the formula:



wherein
n represents an integer having a value of 0, 1 or
Ar represents an aryl group;
each of R^1, R^2, R^3 and R^4 represents a hydrogen atom, an aryl group, an alkyl group having 1 to about 10 carbon atoms in the alkyl moiety or an alkoxy group having 1 to about 10 carbon atoms in the alkoxy moiety and when *n* is 0, R^1 and R^4 are both aryl and when R^1 and R^4 are both hydrogen, R^2 and R^3 are aryl and (3) a substantially colorless benzopyrylium type sensitizer for the photoconductor.

4,045,221

PROCESS OF AMPLIFYING IMAGE IN IMAGE RECORDING LAYER BY RELEASING REACTANT FROM IMAGE FORMING LAYER CONTAINING COBALT(III) COMPLEX

Thap DoMinh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 610,954, Sept. 8, 1975, abandoned, which is a division of Ser. No. 461,172, April 15, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,393
Int. Cl.² G03C 5/00, 5/34, 7/00
U.S. Cl. 96—29 R **3 Claims**

1. A process comprising
A. imagewise exposing to actinic radiation an image-forming layer sensitive to activating radiation and comprising, in intimate association, a chelating compound containing a conjugated π-bonding system capable of forming a tridentate chelate with cobalt(II), and selected from the group consisting of a 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl) formazan dye; a 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-azo-2-(phenol or naphthol); 2-pyridinecarboxylaldehyde-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)hydrazone; or 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-dithiooxamide;
less than 50 mole percent of the anions of the layer being those which will form conjugate acids by deprotonation of a cobalt(III)-complex containing the chelating compound;
and an inert cobalt(III) complex different from said compound and capable of being reduced by a cobalt(III) complex containing said chelating compound to produce a basic ligard;
B. associating with the image-forming layer an image-recording layer which is visibly responsive to at least one basic ligand contained within the cobalt(III) complex upon release thereof; and
C. heating the image-forming layer above ambient temperature for a time sufficient to stimulate reduction of the cobalt(III)complex with
1. concomitant ligand release and transfer of the released ligand to the image-recording layer and
2. the formation of a tridentate chelate of cobalt(II) with said chelating compound, whereby additional cobalt(III)-complex is reduced by said chelate to form additional cobalt(II) and to cause additional release and transfer of released basic ligand to the image recording layer, to give an amplified image.

4,045,222

ETCH BLEACHING PROCESS

Fumiaki Shinozaki; Tomoaki Ikeda, and Masayoshi Tsuboi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 26, 1973, Ser. No. 326,658
Claims priority, application Japan, Jan. 28, 1972, 47-10670
Int. Cl.² G03F 7/02; G03C 5/54
U.S. Cl. 96—33 **9 Claims**

1. In an etch-bleaching process wherein a hydrophilic layer in/on which a silver image exists is first treated with an etch-bleaching solution, to remove those portions of the hydrophilic layer corresponding to the silver image the improvement wherein the hydrophilic layer is subsequently treated with an aqueous solution containing at least one of an oxyacid of chlorine and a salt thereof to remove etched residue of the hydrophilic layer in the area corresponding to the silver image.

4,045,223

METHOD FOR THE PREPARATION OF LAYER STRUCTURES

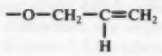
Roland Rubner, Rottenbach near Forchheim; Wolfgang Kleeberg, and Eberhard Kühn, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

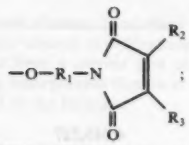
Filed July 24, 1975, Ser. No. 598,651
Claims priority, application Germany, Aug. 2, 1974, 2437368
Int. Cl.[2] G03C 5/00
U.S. Cl. 96—35.1 14 Claims

1. In a method for the preparation of highly heat-resistant layered structures soluble in organic solvents comprising:

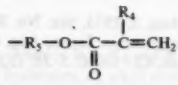
a. applying a coating of a radiation-sensitive, preliminary polymer to a substrate in the form of a layer or a foil;
b. irradiating the radiation sensitive layer or foil through negative patterns;
c. removing the non-irradiated layer or foil to form a relief structure; and
d. annealing said relief structure;

the improvement which comprises using as said radiation sensitive preliminary polymer a solvent soluble preliminary polymer comprising a polycondensation product of a primary diamine with bicyclo[2.2.2.]octene-7-tetracarboxylic acid-2,3,5,6-diester-bis-acid chloride or with a mixture of said bicyclo[2.2.2.]octene with a compound selected from the group consisting of an aromatic di-ortho-tetracarboxylic acid diester-bis-acid chloride, an aromatic di-ortho-tetracarboxylic acid-bis-anhydride and mixtures thereof; wherein the ester groups of said bicyclo[2.2.2.]octene-7-tetra-carboxylic acid-2,3,5,6-diester-bis-acid chloride and said di-ortho-tetracarboxylic acid diester-bis-acid chloride are in ortho position with respect to said acid chloride groups, said ester groups containing radiation reactive radicals selected from the group consisting of:

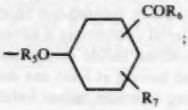


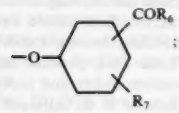


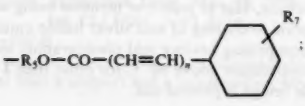
wherein R_1 is alkylene or aralkylene; R_2 is hydrogen, CH_3 or Cl and R_3 is hydrogen;



wherein R_4 is hydrogen or methyl; and R_5 is oxyalkylene;







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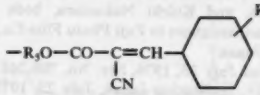
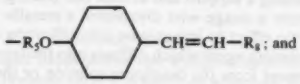
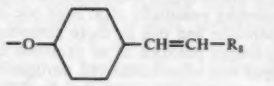


wherein R_6 is alkyl, phenyl, alkoxy phenyl or halogenated phenyl; n is 1 or 2; and R_7 is H, Cl, alkyl or alkoxy;





wherein R_8 is a carbocyclic or heterocyclic aromatic radical bound via a ring carbon atom, and wherein said radiation-sensitive preliminary polymer is prepared in a hexamethyl phosphoric acid triamide solution.

4,045,224

METHOD FOR MAKING PHOSPHOR SCREEN FOR BLACK MATRIX TYPE COLOR PICTURE TUBE USING TWO LIGHT SOURCES

Eiichi Yamazaki, Ichihara, and Hiromi Kanai, Mobara, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 18, 1973, Ser. No. 425,710
Claims priority, application Japan, Dec. 25, 1972, 47-129266
Int. Cl.[2] G03C 5/00
U.S. Cl. 96—36.1 13 Claims

1. A method for making a phosphor screen for a black matrix type color picture tube having a faceplate, comprising forming a first pattern of a black material on the inner surface of the faceplate, said first pattern defining areas in which black material does not cover the inner surface of said faceplate, pattern as well as on those areas of the inner surface of said faceplate not covered for black material, exposing said photosensitive phosphor material layer to light emitted from a first light source and passing through a color selective electrode positioned on the side of said faceplate defining the inner surface of said faceplate, the quantity of light from said first light source being larger at those portions of said photosensitive phosphor material layer corresponding to the areas of the inner surface of said faceplate not covered by said black material, exposing said photosensitive phosphor material layer to light from a second light source on the opposite side of said faceplate, said black material selectively controlling the light from said second light source whereby the quantity of light from said second light source is high only at the portions of the photosensitive phosphor material corresponding to the areas not covered by said black material, the quantity of light emitted either from said first light source or from said second light source being insufficient to activate said photosensitive material layer and the total quantities of light from said first and second light sources together being sufficient to activate said photosensitive material layer to thereby cooperatively limit the portions of the phosphor material layer remaining on said faceplate after subsequent development of said photosensitive phosphor material layer to the areas on the inner surface of said faceplate not covered by said black material, and developing said photosensitive phosphor material layer to remove those portions of said phosphor material layer covering said black material.

4,045,225

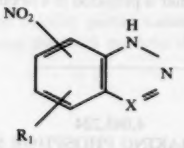
METHOD OF FORMING A PHOTOGRAPHIC IMAGE

Isao Shimamura, and Koichi Nakamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 23, 1976, Ser. No. 708,248
Claims priority, application Japan, July 23, 1975, 50-89899
Int. Cl.[2] G03C *5/32*
U.S. Cl. 96—60 R **7 Claims**

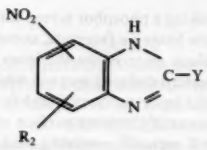
1. A method of forming an image which comprises subjecting an image-wise exposed and developed photographic element comprising a support and at least one photographic layer in which there is image-wise distributed a metallic silver having a catalytic effect to image-wise intensification in the presence of a reducing agent which diffuses into the layer of photographic element from the developer solution or the intensifier solution, or is previously incorporated into the layer, using a solution consisting essentially of at least one of a halogenite, hydrogen peroxide and one or more compounds capable of releasing hydrogen peroxide as an oxidation agent; and containing at least one nitro-substituted nitrogen-containing heterocyclic compound represented by the following General formulae (I) and (II);

(I)



in which R_1 represents a hydrogen atom, an alkyl group of 1 to 5 carbon atoms, SO_3M or COOM wherein M represents hydrogen atom, an alkali metal or an ammonium group, X represents nitrogen atom or CR′ wherein R′ represents a hydrogen atom or a lower alkyl group of 1 to 5 carbon atoms, and

(II)



in which R_2 represents hydrogen atom, an alkyl group of 1 to 5 carbon atoms, SO_3M or COOM wherein M represents hydrogen atom, an alkali metal or ammonium group and Y represents hydrogen atom, an alkyl group of 1 to 5 carbon atoms or $CH_2—S—(CH_2)_n—Y'$ wherein n represents 1 to 3 and Y′ represents a hydrogen atom or SO_3M.

4,045,226

IMAGE FORMING PROCESS BY COLOR INTENSIFICATION

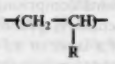
Hiroshi Hara, and Takushi Miyazako, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 16, 1976, Ser. No. 705,990
Claims priority, application Japan, July 17, 1975, 50-87484
Int. Cl.[2] G03C *5/32, 1/72*
U.S. Cl. 96—60 R **7 Claims**

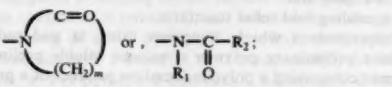
1. A color image forming process for an image-wise exposed color photographic element comprising a support having coated thereon at least one photosensitive silver halide emulsion layer, and optionally at least one auxilliary non-photosensitive layer, including at least a color development and simultaneously or subsequent thereto an intensification, in the presence of a color former and a reducing agent which is oxidized and oxidatively coupled with the color former which comprises carrying out the intensification step in the presence of a peroxide intensifying agent and a compound having a polymerization degree of 1 to 8,000 represented by the following general formula in at least one of said photosensitive silver halide emulsion layer and said auxiliary non-photosensitive layer, if the latter layer is present;

$$—(A)_x—(B)_y—$$

wherein A represents



wherein R represents



R_1 represents an alkyl group of 1 to 6 carbon atoms; R^2 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms; and m represents an integer of 3 to 7; B represents a monomer unit induced from styrene, methacrylic acid ester, acrylic acid ester, vinyl acetate, acrylonitrile, vinyl alcohol, vinyl chloride, vinyl ether, acrylamide, N,N-dimethylacrylamide, acrylic acid, methacrylic acid, maleic acid, potassium styrene-sulfonate, N,N-dialkylaminoalkyl methacrylate, vinylimidazole or vinyl pyridine; and x and y represent mole percents; the sum of x and y being 100 mole percent and x being equal to or higher than 30 mole percent.

4,045,227

METHOD FOR STABILIZING SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shinpei Ikenoue, and Eiichi Mizuki, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 3, 1973, Ser. No. 385,268
Claims priority, application Japan, Aug. 4, 1972, 47-7820872
Int. Cl.[2] G03C *5/38, 1/28*
U.S. Cl. 96—61 R **17 Claims**

1. A dry method of stabilizing a silver halide photographic print-out material containing a visible image formed therein against substantial changes in density in non-print-out areas, said visible image being printed-out through an image-wise exposure, said material comprising a silver halide emulsion on a support, which silver halide comprises at least 50 mol % silver bromide, and having at least one member selected from the group consisting of iodine, silver iodide, potassium iodide, sodium iodide, calcium iodide, magnesium iodide, ammonium iodide, nickel iodide, rubidium iodide, cesium iodide, lithium iodide, manganese iodide, barium iodide, chromium iodide, hydrogen iodide, iodic acid, periodic acid, iodine chloride, potassium iodate, sodium iodate and sodium periodate in said silver halide emulsion or in an adjacent layer to said silver halide emulsion, said at least one member being added to said material prior to coating of said silver halide emulsion on said material, comprising heating said photographic material while dry at a temperature above **80°** C for more than **1** second after said visible image is printed-out.

4,045,228

DIRECT POSITIVE EMULSIONS CONTAINING FOGGED, MONODISPERSED SILVER HALIDE GRAINS HAVING MORE THAN 10 MILE % IODIDE

Willy Joseph Vanassche, Kontich; Herman Alberik Pattyn, Kapellen, both of Belgium; Otto Lapp, Leverkusen; Sieghart Klotzer, Cologne, and Erik Moisar, Cologne-Flittard, all of Germany, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Nov. 20, 1973, Ser. No. 417,500
Int. Cl.[2] G03C *5/24, 1/28*
U.S. Cl. 96—64 13 Claims

1. Photographic material comprising at least one layer of a direct-positive radiation-sensitive emulsion having high sensitivity and good maximum density containing fogged homodisperse silver halide grains wherein at least 95% by weight of the silver halide grains of the emulsion have a diameter which is within about 40% of the mean grain diameter and wherein the silver halide of the grains has a silver iodide content of more than 10 mole % and at most about 20 mole % relative to the total amount of silver halide.

4,045,229

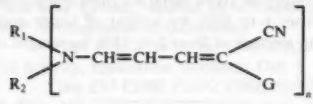
NOVEL UV ABSORBING COMPOUNDS AND PHOTOGRAPHIC ELEMENTS CONTAINING UV ABSORBING COMPOUNDS

Wayne Woodrow Weber, II, and Donald Warren Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 506,913, Sept. 17, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 641,788
Int. Cl.[2] G03C *1/84*
U.S. Cl. 96—84 UV 19 Claims

1. In a photographic element comprising a support, at least one radiation sensitive silver halide emulsion layer and an ultraviolet absorbing compound, the improvement comprising the use of a 1-amino-4-cyano-1,3-butadiene ultraviolet absorbing compound.

10. A photographic element comprising at least one silver halide emulsion layer coated on a film support, said film support being selected from a solvent cast or melt-formed film support and having incorporated therein at least one ultraviolet filter compound of the formula:



wherein n is 1 or 2, when n is 1, R_1 and R_2 are independently chosen to represent hydrogen, an alkyl group of 1 to 10 carbon atoms, an aryl group of 6 to 10 carbon atoms, or a cyclic alkyl group of 5 or 6 carbon atoms provided that R_1 and R_2 cannot both be hydrogen, or R_1 and R_2 taken together represent the atoms necessary to complete a cyclic amino group and when n is 2 at least one of R_1 and R_2 is alkylene or arylene, and G represents an electron withdrawing group.

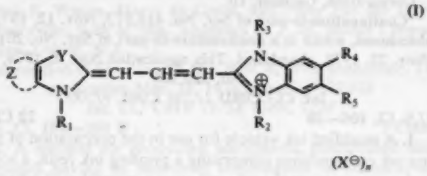
4,045,230

LIGHT-SENSITIVE SUPER-SENSITIZED SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Takeo Koitabashi; Hideo Akamatsu, and Noboru Fujimori, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

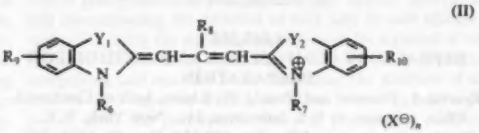
Filed Mar. 16, 1976, Ser. No. 667,361
Claims priority, application Japan, Mar. 19, 1975, 50-33159
Int. Cl.[2] G03C *1/40, 1/14*
U.S. Cl. 96—100 R 11 Claims

1. A light-sensitive silver halide color photographic material comprising at least a support and a red-sensitive, silver halide-containing layer which comprises at least one sensitizing dye of the following general formula (I)



(I)

wherein Z is a non-metallic atom group necessary to form a non-substituted naphthalene and a non-substituted or alkoxy-substituted benzene ring; Y is sulfur or selenium; R_1 and R_2 are individually alkyl, sulfoalkyl, carboxy alkyl, alkoxy alkyl, hydroxy alkyl or aralkyl; R_3 is alkyl, acyloxyalkyl, aryl or aralkyl and at least one of R_1 and R_2 is carboxyalkyl or sulfoalkyl; R_4 is hydrogen or halogen; R_5 is trifluoroalkyl or trifluoroalkylsulfonyl; X is an anion and n is zero or 1, and an inner salt is formed when n is zero; and at least one sensitizing dye of the following general formula (II)



(II)

wherein Y_1 and Y_2 are individually sulfur or selenium; R_6 and R_7 are individually a substituent selected from the same groups as defined as to R_1 and R_2; and at least one of R_6 and R_7 is carboxyalkyl or sulfoalkyl; R_8 is lower alkyl; R_9 and R_{10} are individually hydrogen, halogen, alkyl, alkoxy or aryl; X is an anion and n is zero or 1, provided that an inner salt is formed when n is zero.

11. A photographic material according to claim 1, wherein the layer further comprises a cyan coupler.

4,045,231

PHOTOSENSITIVE RESIN COMPOSITION FOR FLEXOGRAPHIC PRINTING PLATES

Hiroyuki Toda, Samukawa; Eiichi Otomegawa, Kawasaki; Toshimi Aoyama, Yokohama, and Hisashi Nakane, Kawasaki, all of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 18, 1976, Ser. No. 658,855
Claims priority, application Japan, Oct. 17, 1975, 50-125092; Mar. 15, 1975, 50-31414
Int. Cl.[2] G03C *1/68*
U.S. Cl. 96—115 P 10 Claims

1. A photosensitive resin composition for flexographic printing plates comprising (a) styrene-butadiene block copolymer containing 35–50% by weight of styrene, (b) at least one liquid prepolymer having a molecular weight of 1,000–5,000 selected from the group consisting of polybutadiene and butadiene-styrene copolymer, and (c) at least one photopolymerizable monomer containing one or more vinyl groups.

4. The photosensitive resin composition of claim 1 wherein said photopolymerizable monomer as the component (c) is a polyvinyl ester obtained by reacting a diol or triol having 2–10 carbon atoms with a monoethylenically unsaturated monocarboxylic or polycarboxylic acid having 3–5 carbon atoms.

4,045,232

PRINTING INK COMPOSITION

Harold B. Parkinson, Gardner, Ill., assignor to Topar Products Corporation, Gardner, Ill.

Continuation-in-part of Ser. No. 414,872, Nov. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 201,242, Nov. 22, 1971, abandoned. This application Nov. 1, 1974, Ser. No. 520,164

Int. Cl.[2] C08D *11/06*; C08L *91/00*

U.S. Cl. 106—28 22 Claims

1. A modified ink vehicle for use in the preparation of printing ink compositions comprising a printing ink resin, a solvent and a strong mineral acid, said strong mineral acid being present at a level of from about 5 to about 20 cc per pound of resin, said printing ink resin being fluid and having a viscosity at room temperature in the range of from about Q to Z6 as determined by the Gardner-Holdt method, said strong mineral acid being selected from the group consisting of nitric acid and mixtures of nitric acid with sulphuric acid having at least about 50 percent by weight of nitric acid, said solvent being selected from the group consisting of turpentine, mineral spirits and short chain esters having a straight or branched chain aliphatic acid moiety of from 2 to 6 carbons and a straight or branched chain, aliphatic alcohol moiety of from 2 to 6 carbons.

4,045,233

REFRACTORY COMPOSITION AND METHOD FOR PREPARATION

Everett A. Thomas, and Ronald W. Knake, both of Cincinnati, Ohio, assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 639,582, Dec. 10, 1975. This application Sept. 27, 1976, Ser. No. 726,999

Int. Cl.[2] C04B *35/48*

U.S. Cl. 106—57 10 Claims

1. A refractory composition comprising from 45% to 70% alumino-silicate, from 5% to 15% calcined alumina, from 15% to 35% zircon, from 1% to 5% clay and from 1% to 5% pyrophyllite, said alumino-silicate containing from 45% to 75% alumina.

4,045,234

PROCESS FOR PRODUCING HIGH DENSITY SINTERED ALUMINA

Terry A. Ring, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 23, 1976, Ser. No. 716,723

Int. Cl.[2] C01F *7/06, 7/46*

U.S. Cl. 106—62 7 Claims

1. A process for producing sintered alumina shapes or grains of low porosity and reduced Na content which comprises treating a calcined alumina, resulting from the calcination of a Bayer process alumina hydrate precursor, possessing a 2–6 micron average particle size and having an Na_2O content in the range of about 0.2–1.0% by weight of Al_2O_3 with a synergistically acting combination of a boron-free magnesium salt and a boron compound, wherein the magnesium salt is selected from the group consisting essentially of water-soluble and essentially water-insoluble magnesium salts which during sintering of the alumina shapes decompose without leaving anionic impurities in the sintered alumina shape and wherein the boron compound is H_3BO_3 or B_2O_3, wherein in the combination, the quantity of magnesium salt, calculated as Mg, is kept in the range of about 0.01–0.3% by weight of Al_2O_3 and the amount of boron compound, calculated as B_2O_3, is maintained in the range of about 0.1–1.0% by weight of Al_2O_3, shaping and sintering the calcined alumina for a time period of 1 to 25 hours within the temperature range of about 1600° and 1900° C, and recovering a sintered alumina having a porosity of less than about 3% by volume and an Na content of less than about 0.03% by weight of Al_2O_3.

4,045,235

TREATMENT OF CLAY MINERALS

Jan Ivan Bidwell; Roger William Adams, and Walter Brian Jepson, all of St. Austell, England, assignors to English Clays Lovering Pochin & Company, Limited, St. Austell, England

Continuation-in-part of Ser. No. 350,395, April 12, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,526

Int. Cl.[2] C04B *33/13, 33/04*

U.S. Cl. 106—72 20 Claims

1. A method of treating a clay in order to improve the rheological properties of the clay which method comprises forming a mixture of (i) an aqueous suspension of the clay containing less than 450 parts per million of dissolved silicate, expressed as SiO_2, and at a pH in the range 5 to 9 and (ii) a weakly positively charged inorganic hydroxy polymer of aluminum in a quantity such that there is present in the mixture from 0.5 to 10.0 mg of aluminum per gram of clay, calculated on a dry weight basis; the inorganic hydroxy polymer of aluminum being represented by the formula:

$$Al(OH)_n . (3-n)X^-$$

where $0.5 \leqq n \leqq 2.8$ and X^- is Cl^-, NO_3^- or $\frac{1}{2}\ SO_4^{2-}$, and being formed by combining an inorganic aluminum salt and a base selected from the group consisting of the carbonates and hydroxides of lithium, sodium and potassium.

4,045,236

CELLULAR CEMENT COMPOSITION

Giuseppe Bianchi, Lerici (La Spezia), Italy, assignor to I.GE.Co. Z.r.l., Italy

Filed Apr. 8, 1975, Ser. No. 566,526

Int. Cl.[2] C04B *15/02*

U.S. Cl. 106—88 7 Claims

1. A light, high tensile strength cellular cement composition having a homogeneous distribution of microporosities of diameters of from 0.1 to 4 mm sufficient to produce a specific gravity of from about 800 k/m^3 to about 1600 k/m^3, said composition containing from about 300 to 800 k of cement per m^3 of composition, up to 1000 k of inert fillers per m^3 of composition and from 36 to 68% water by weight of composition, and further containing an alkali metal alkylbenzenesulfonate in an amount of from 1 to 45% by weight of water and a metal chloride in an amount of from 2 to 35% by weight of water.

4,045,237

CEMENTITIOUS COMPOSITIONS HAVING FAST-SETTING PROPERTIES AND INHIBITED SHRINKAGE

Robert W. Gaines, Darien; Dennison F. Fiala, Ridgefield, and Henry Nash Babcock, Old Greenwich, all of Conn., assignors to U.S. Grout Corporation, Old Greenwich, Conn.

Filed Dec. 6, 1974, Ser. No. 530,363

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—89 5 Claims

1. A cementitious composition which when mixed with water is capable of setting into a hard mass in a short period of time without substantial shrinkage during setting and early hardening, and possessing a high degree of impermeability to fluids, said composition comprising:

a. between 0.1 and 10 weight percent of portland cement;

b. between 0.1 and 40 weight percent of a calcined gypsum selected from the group consisting of normal calcined gypsum, anhydrite, and pressure calcined gypsum; and

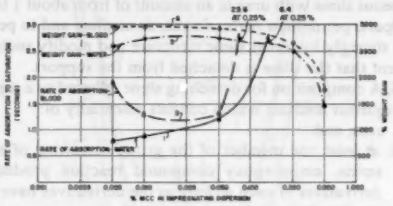
c. between 50 and 90 percent of high alumina cement.

4,045,238

REGENERATED CELLULOSE SPONGE

Orlando A. Battista, and Richard L. Ward, both of Fort Worth, Tex., assignors to Avicon, Inc., Fort Worth, Tex.

Division of Ser. No. 471,546, May 20, 1974, Pat. No. 3,954,493, which is a continuation-in-part of Ser. No. 299,131, Oct. 19, 1972, abandoned. This application Dec. 4, 1975, Ser. No. 637,716
Int. Cl.[2] C08L *1/24*
U.S. Cl. 106—122 8 Claims



1. A method for increasing the liquid absorbency of regenerated cellulose sponge which comprises immersing the sponge, free of water-soluble materials, in a solution or dispersion consisting of water and a water-soluble or water-dispersible, high molecular weight, hydrophylic, film-forming polymer, the solution or dispersion containing from about 0.005 to about 0.250% by weight of the polymer, compressing and releasing the sponge while so immersed so as to impregnate the sponge with and distribute uniformly throughout the sponge the film-forming polymer, drying the impregnated sponge to a volatiles content including water of not more than about 0.5%, conditioning the dried sponge to a moisture content of at least about 6% and compressing the conditioned sponge.

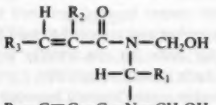
4,045,239

PROCESS FOR THE PRODUCTION OF THERMOPLASTIC SYNTHETIC MATERIALS AND PLASTIC SHAPING MATERIALS OF CHEMICALLY MODIFIED PROTEIN AND A CHEMICAL PLASTICIZER AND INCLUDING A BISACRYLAMIDE OR BISMETHACRYLAMIDE

Klaus-Dieter Hammer, Mainz; Wolfgang Klendauer, Wiesbaden, and Max Bytzek, Naurod, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Oct. 3, 1975, Ser. No. 619,224
Claims priority, application Germany, Oct. 7, 1974, 2447690
Int. Cl.[2] C08K *11/00;* C08L *89/00*
U.S. Cl. 106—147 19 Claims

1. A process for the production of a thermoplastic synthetic material of chemically modified casein, which comprises mixing an aqueous alkaline casein solution with an aqueous solution of a tetrafunctional, doubly unsaturated, organic compound of the general formula



in which

R_1 is hydrogen or an alkyl group with 1 to 18 carbon atoms,

R_2 is hydrogen or an alkyl group with 1 to 6 carbon atoms, and

R_3 is hydrogen or an alkyl group with 1 to 3 carbon atoms, subjecting the mixture to a dwell time, causing a precipitating liquid to act upon it, freeing the formed precipitate from excess liquid, and drying.

4,045,240

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Havre de Grace, and Peter van der Heem, Perryville, both of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 286,656, Sept. 6, 1972, abandoned. This application Mar. 24, 1976, Ser. No. 670,018
Int. Cl.[2] C01B *33/18;* C09C *1/28*
U.S. Cl. 106—288 B 7 Claims

1. A method for producing amorphous, precipitated silica pigments having an improved combination of chemical and physical properties, said method comprising the steps of: acidulating an aqueous solution of an alkali metal silicate with an acid selected from the group consisting of sulfuric acid, nitric acid, and hydrochloric acid; said alkali metal silicate having a SiO_2/X_2O mol ratio in the range of from about 2.0 to 2.7 wherein X is selected from the group consisting of sodium, potassium, and lithium; said aqueous alkali metal silicate solution having a concentration on the order of about 1.0 to 2.5 pounds silicate per gallon, said acid being added as a dilute solution thereof and having a concentration of from about 10 to 25% by weight acid based on the weight of the solution thereof; continuing the addition of said acid until that point at which precipitation of said pigment just begins; interrupting and discontinuing the addition of said acid to said silicate at said point; aging the aqueous reaction mass for a period of time sufficient to obtain an equilibrium condition of the reactants comprising said reaction mass; continuing the addition of said acid to said aqueous silicate solution following said aging period until the precipitation of said pigment is complete; separating the precipitated pigment from the reaction mass and recovering the product.

4,045,241

SYNTHETIC TAENIOLITE AND PROCESS OF PRODUCING THE SAME

Nobutoshi Daimon, 195-112, Aza Kanda, Mikuriya, Kawanakajima-cho, Nagano, Nagano, and Toichiro Izawa, 25-26, Koganehara 7-chome, Matsudo, Chiba, both of Japan

Filed Mar. 3, 1976, Ser. No. 663,225
Int. Cl.[2] C09C *1/02*
U.S. Cl. 106—306 2 Claims

1. A process of producing taeniolite having the formula, $LiMg_2Li(X_4O_{10})F_2$ wherein X represents Si or Ge, which comprises mixing (a) a lithium compound selected from the group of lithium oxide and lithium fluoride, (b) a magnesium compound selected from the group of magnesium fluoride and magnesium oxide and (c) silicon oxide or germanium oxide in such a manner that the mixing ratio of Li : Mg : Si or Ge : F becomes 1 : 1 : 2 : 1, the fluoride being included in an excess amount of 10 – 30% to compensate for the loss of fluorine during the process; melting the mixture at 1,250° – 1,450° C; and slowly cooling until the melt crystallizes.

4,045,242

PROCESS FOR THE PURIFICATION OF SUGARBEET JUICE AND THE REDUCTION OF LIME SALTS THEREIN

Karlheinz W. R. Schoenrock, and Hugh G. Rounds, both of Ogden, Utah, assignors to The Amalgamated Sugar Company, Ogden, Utah

Continuation-in-part of Ser. No. 715,182, Aug. 17, 1976, abandoned. This application Dec. 3, 1976, Ser. No. 747,095
Int. Cl.[2] C13D *3/06*
U.S. Cl. 127—50 1 Claim

1. In the purification of raw sugarbeet juice having relatively low or even negative so-called effective alkalinity involving the treatment of the juice with an alkaline earth metal oxide and with carbon dioxide and separating precipitated solids from the liquid phase of the treated material, the improvement which comprises overcarbonating the juice to an alkalinity of

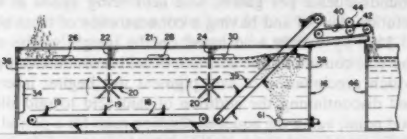
0.0 to 0.02% CaO equivalent during final carbonation in a gassing vessel; adding sufficient active MgO into the gassing vessel while carbonating to raise the effective alkalinities to around 0; and, subsequently, re-alkalizing the overcarbonated juice to an alkalinity of 0.01 to 0.03% CaO equivalent by the addition of active MgO, followed by a final separation of precipitated solids.

4,045,243

CARBON PAPER RECYCLING SYSTEM

Andrew M. Wohlert, St. Charles, Ill., assignor to Riverbank Laboratories, Inc., Geneva, Ill.

Filed May 19, 1975, Ser. No. 578,366
Int. Cl.² B08B *3/10, 3/12*
U.S. Cl. 134—1 **12 Claims**



1. A continuous process for removing the wax-carbon coating from carbon paper which coating comprises a wax which floats in water and pigment, comprising the steps of

passing said carbon paper through a first aqueous bath having a temperature of between about 170° F and 200° F to cause some of said wax and pigment to separate from said paper,

said bath comprising a solution of a wetting agent and water,

mechanically agitating said bath,

collecting and removing the wax which floats to the top of said bath,

then passing said carbon paper through a squeezer to remove the major portion of the water therefrom,

then passing the carbon paper through a second aqueous bath having a temperature in the range of about 200° F to less than the boiling point,

said second aqueous bath comprising a solution of a wetting agent and water,

collecting and removing the wax which floats to the top of said second bath,

then removing the paper from said second tank,

then squeezing the paper removed from said second tank to remove the major portion of the water therefrom,

then passing the paper through a water rinse bath, and

removing the paper from said rinse bath.

6. Apparatus for removing the wax-carbon coating from carbon paper, which coating contains wax and pigment which floats in water, comprising

an elongated tank for containing heated water,

a plurality of transverse baffles disposed in said tank near and above the surface of said water therein to separate said tank into a plurality of sections,

conveyor means in said tank for causing carbon paper inserted in the front of said tank to be carried beneath said baffles toward the rear of said tank,

means for removing said carbon paper through a surface area of said water near the rear end of said tank, and

means for causing the level of liquid at said area to be higher than the liquid level in the adjacent portions of said tank so that any wax and pigment contained therein floats away from the area through which said paper is removed from said tank.

4,045,244

REMOVAL OF MICROBIOLOGICAL DEPOSITS

K. Robert Lange, Huntingdon Valley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 400,461, Sept. 24, 1973, abandoned. This application May 5, 1976, Ser. No. 683,609
Int. Cl.² B08B *9/00*
U.S. Cl. 134—22 R **6 Claims**

1. A method of detaching hydrated slime adhered to a support in an aqueous medium which comprises contacting said aqueous slime with urea in an amount of from about 1 to about 100parts per million parts of aqueous medium and to penetrate the strongly hydrated slime structure and modify such to the extent that the slime is detached from the support.

5. A composition for detaching slime adhered to a support in an aqueous medium which consists essentially of:

i. urea; and

ii. at least one member of the group consisting of ethanolamine, amine-epoxy compound reaction products and derivatives of each so long as the derivatives have hydrogen-bonding characteristics,

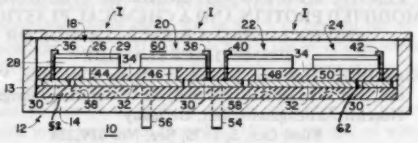
wherein the members of (i) and (ii) are present in the composition in a weight ratio of from about 5 to 95% and 95 to 5% respectively.

4,045,245

SOLAR CELL PACKAGE

Michael G. Coleman, Tempe, and Robert A. Pryor, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1976, Ser. No. 646,733
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 C **16 Claims**



1. A solar cell package comprising:

a back member;

transparent cover plate means said back member and said cover plate means being adapted for enclosing a space bounded by said back member and said cover plate means;

a plurality of solar cells, each having a first and a second surface thereof, located within said space;

first conductor means located between said solar cells and said back member and coupled to said first surface of each of said solar cells for electrically contacting said first surface of each of said solar cells;

second conductor means located between said solar cells and said back member coupled to said second surface of each of said solar cells for electrically contacting said second surface of each of said solar cells;

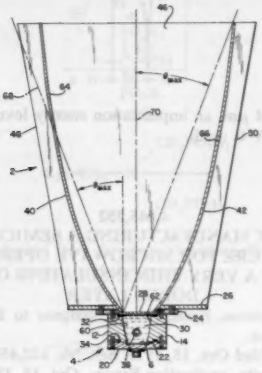
insulating means located between said back member and said first and second conductor means and also located between said first and second conductor means and said solar cells for preventing portions of said first and second conductor means from contacting or touching portions of said solar cells and for preventing portions of said first and second conductor means from contacting or touching portions of said back member.

4,045,246

SOLAR CELLS WITH CONCENTRATORS

Abraham I. Mlavsky, Lincoln, Mass., and Roland Winston, Chicago, Ill., assignors to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Aug. 11, 1975, Ser. No. 603,276
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 PC 12 Claims



1. Apparatus for converting solar radiation to electrical energy comprising means defining a closed chamber with a wall capable of passing solar radiation, at least one solar cell disposed in said chamber, first solar radiation concentrator means for receiving solar radiation and directing it through said wall into said chamber, said chamber comprising second solar radiation concentrator means for directing said solar energy onto said at least one solar cell, and a cooling fluid in said chamber, said cooling fluid being (a) electrically non-conductive, (b) capable of passing said solar radiation to said at least one solar cell, and (c) having a higher-than-air index of refraction.

10. Apparatus for converting solar radiation to electrical energy comprising means defining a closed chamber with an entrance aperture capable of passing solar radiation, said chamber including walls adapted to reflect said solar radiation onto a predetermined position, at least one solar cell disposed in said chamber in said position to receive said radiation, and a cooling fluid in said chamber in contact with said at least one solar cell, said cooling fluid being (a) electrically non-conductive, (b) capable of transmitting solar radiation from said entrance aperture to said at least one solar cell, and (c) having a higher-than-air index of refraction.

4,045,247

THERMOCOUPLES OF TANTALUM AND RHENIUM ALLOYS FOR MORE STABLE VACUUM-HIGH TEMPERATURE PERFORMANCE

James F. Morris, Fairview Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,457
Int. Cl.[2] H01L *35/20*; G21H *1/10*
U.S. Cl. 136—240 7 Claims

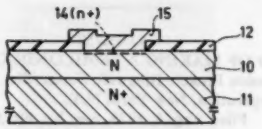
1. A thermocouple for measuring temperature in high temperature systems having a bimetallic thermocouple sensor wherein each metal of said bimetallic sensor is dissimilar and is selected from the group consisting of tantalum, rhenium and alloys thereof containing only rhenium and tantalum.

4,045,248

MAKING SCHOTTKY BARRIER DEVICES

John Martin Shannon, Whyteleafe, and Julian Robert Anthony Beale, Redhill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 480,540, June 18, 1974, Pat. No. 3,943,552.
This application July 25, 1975, Ser. No. 599,088
Claims priority, application United Kingdom, June 26, 1973, 30179/73
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 19 Claims



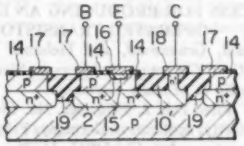
1. A method of manufacturing a semiconductor device having a Schottky barrier of desired barrier height between a metal and a semiconductor body portion but without significant degrading of its reverse characteristics, comprising providing a semiconductor body portion of given doping level which if directly contacted with a metal capable of forming therewith a Schottky barrier would result in a barrier of given height different from the desired barrier height, subjecting the said body portion to dopant ion bombardment to implant dopant therein to form a shallow surface layer having a higher doping level than said given doping level, the implanted ion dose being such as to change the given barrier height to that desired when contacted by said metal, the bombarding ion energy being such as to restrict the depth of the implanted layer from the surface to such a small value that it remains below the thickness of the depletion layer extending from the Schottky barrier in the zero bias condition of the barrier, whereby the implanted layer remains substantially depleted of charge carriers and the reverse characteristics of the barrier will not be significantly degraded, applying said metal as a contact to said body portion such that the barrier is formed between said metal and said shallow surface layer, and making an electrical connection to the body portion.

4,045,249

OXIDE FILM ISOLATION PROCESS

Atsuo Hotta, Higashiyamato, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 24, 1975, Ser. No. 634,783
Claims priority, application Japan, Nov. 22, 1974, 49-133658
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 7 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:

a. selectively forming a masking layer on one principal surface of a semiconductor substrate having the same crystalline structure throughout beneath said surface, said masking layer having a window which exposes a portion of said one principal surface of said substrate;

b. removing semiconductor material through said window from said substrate so as to form a groove in the exposed portion of the one principal surface of said substrate;

c. selectively implanting, through said window in said masking layer, ions of at least one element consistng of the group consisting of oxygen and nitrogen into said substrate, thereby forming a buried insulator layer spaced beneath the bottom of said groove by a prescribed distance; and

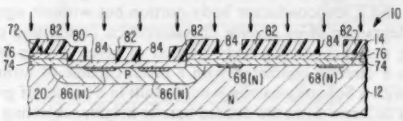
d. oxidizing that portion of said substrate exposed by said groove and not masked by said masking layer so as to form an insulator layer which fills said groove and extends therebeneath to be contiguous with said buried insulator layer.

4,045,250

METHOD OF MAKING A SEMICONDUCTOR DEVICE

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,832
Int. Cl.[2] H01L *7/54, 21/265*
U.S. Cl. 148—1.5 **6 Claims**



1. A method of making a semiconductor device comprising a body of semiconductor material having a surface and which has regions of relatively high and relatively low conductivity comprising:

forming on a surface of said body a masking coating having relatively thick portions and relatively thin portions,

depositing on said masking coating a layer of photoresist and forming openings therein at predetermined locations adjacent to both relatively thick portions and relatively thin portions on said masking coating at which regions of both relatively high and relatively low conductivity are to be introduced,

implanting conductivity modifiers into said body with sufficient energy to penetrate said masking coating but with insufficient energy to penetrate the combination of the masking coating and said photoresist,

without removing said photoresist, contacting the exposed areas of said masking coating with a solvent therefore for a time adequate to remove only the relatively thin portions thereof, and

diffusing conductivity modifiers into the semiconductor body through the areas so removed.

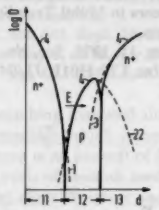
4,045,251

PROCESS FOR PRODUCING AN INVERSELY OPERATED TRANSISTOR

Jüergen Graul, Gruenwald, and Helmuth Murrmann, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,616
Claims priority, application Germany, Feb. 21, 1975, 2507613
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 **2 Claims**

1. A process for the production of an inversely operated transistor in a semiconductor body on the surface of which are formed in spaced arrangement, collector region, then a base region and an emitter region wherein said base region is doped by ion implantation in such a manner that minority charge carriers injected from the emitter region into the base region are accelerated in the direction towards the collector region as a result of an inner drift field in the base region, wherein the ion implantation of the base region is accomplished in one step and wherein so as to dope the base region with a doping concentration of approximately $2 \cdot 10^{17}/cm^3$ in the vicinity of the emitter region, and wherein said base region has dimensions between



0.7 μm and 0.4 μm, an implantation energy level of approximately 300 keV is used.

4,045,252

METHOD OF MANUFACTURING A SEMICONDUCTOR STRUCTURE FOR MICROWAVE OPERATION, INCLUDING A VERY THIN INSULATING OR WEAKLY DOPED LAYER

Paul Cyril Moutou, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 15, 1975, Ser. No. 622,455
Claims priority, application France, Oct. 18, 1974, 74.35143
Int. Cl.[2] H01L *7/54*
U.S. Cl. 148—1.5 **3 Claims**

1. A method of manufacturing a semiconductor structure designed for microwave operation, comprising at least two following steps:

a. excessively doping by N type impurities to a concentration in excess of 10^{16} atom/cm^3 at least a layer of a gallium arsenide substrate having two parallel large faces;

b. bombarding said substrate with beryllium ions so as to implant an excessively P-doped layer to a concentration in excess of 10^{16} atom/cm^3 parallel to said large faces, thus promoting at the border separating the N and P layers the spontaneous formation of a thin layer much less doped than said N and P layers.

4,045,253

PASSIVATING METAL SURFACES

William P. Banks, and Larry D. Martin, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 15, 1976, Ser. No. 666,855
Int. Cl.[2] C23F *9/02*
U.S. Cl. 148—6.14 R **8 Claims**

1. A method for the simultaneous neutralization and passivation of an acid-treated ferrous metal surface comprising:

contacting an acid-treated ferrous metal surface with an aqueous solution consisting essentially of

a. a base selected from alkali metal hydroxides, ethanolamines, alkali metal carbonates, alkali metal gluconates, alkali metal borates and mixtures thereof, said base being present in said aqueous solution in the range of from about 0.01 to about 3.0 percent base by weight of said solution;

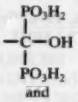
b. an oxygen containing gas present in said solution in an amount sufficient to saturate said solution with oxygen at the temperature and pressure of said contacting;

c. hydrazine present in said solution in the range of from about 0.001 to about 0.1 percent hydrazine by weight of said solution; and

d. an iron complexing agent selected from the group consisting of alkali metal gluconates; alkali metal salts of ethylenediaminetetraacetic acid; ethanolamines; polyphosphonic acids having the formula

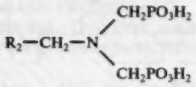
(1)

wherein R_1 is selected from the class consisting of C_1 to C_{12} alkyl groups and the group

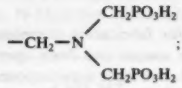


and

(2)



where R_2 is selected from the class consisting of —H, —PO_3H_2, C_1 to C_{12} alkyl groups, and the group



the alkali metal and amine salts of said polyphosphonic acids; and mixtures thereof; said complexing agent being present in said aqueous solution in the range of from about 0.01 to about 1.0 percent complexing agent by weight of said solution;

maintaining said contact for a time sufficient to neutralize and passivate said ferrous metal surface, wherein the pH of said solution is greater than about 8.0 and said contacting is conducted at a temperature greater than about 220° F and less than the degradation temperature of chemicals in said solution.

4,045,254

METHOD FOR TOUGHENING TREATMENT OF METALLIC MATERIAL

Akio Deguchi, Yokohama, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,393
Int. Cl.[2] C21D *7/14*
U.S. Cl. 148—12 R **10 Claims**

1. A method for providing a toughening treatment for a piece of steel which has at least one transformation point, that is a limiting temperature at which a change in phase occurs, by making use of transformation super-plastic phenomena, comprising: simultaneously

a. applying a shearing stress to the piece of steel, and

b. cyclically heating for a half cycle and cooling for a half cycle the piece of steel,

and in so doing, observing the following constraints:

1. the applied shearing stress has a value in the range of about 1/20th to about 1/10th of the yield point of said steel;

2. each half-cycle during which the steel is heated, it is raised to a temperature that is above said transformation point, and each half-cycle during which the steel is cooled, it is lowered to a temperature that is below said transformation point;

3. the steel is subjected to at least three of these heating and cooling cycles, and

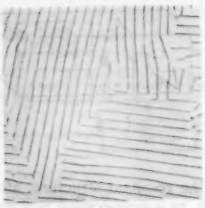
4. each such cycle has a period of about 20 seconds.

4,045,255

DIRECTIONALLY SOLIDIFIED EUTECTIC $\gamma+\beta$ NICKEL-BASE SUPERALLOYS

Melvin R. Jackson, Schenectady, N.Y., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 1, 1976, Ser. No. 691,936
Int. Cl.[2] C22C *19/03*
U.S. Cl. 148—32 **12 Claims**



1. An article of manufacture having improved high temperature strength and oxidation resistance properties comprising a directionally solidified multivariant eutectic $\gamma+\beta$ nickel-base superalloy casting containing a two phase eutectic structure consisting of a γ phase matrix of a face-centered-cubic solid solution crystal structure based on nickel having embedded in the γ phase an aligned reinforcing lamellar β phase consisting primarily of a nickel-aluminum (NiAl) composition which is a body-centered-cubic (CsCl) ordered intermetallic based on NiAl.

4,045,256

CHROME STEEL CASTING ALLOY

Robert B. Fischer, Easton, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 555,598, March 5, 1975, abandoned.
This application June 9, 1976, Ser. No. 694,348
Int. Cl.[2] C22C *38/44*
U.S. Cl. 148—36 **1 Claim**

1. A low chrome nickel martensitic casting manufactured to the standards of ASTM A 217 Gr C5 consisting essentially of

Ingredient	Wt. Percent
Carbon (C)	less than 0.06
Manganese (Mn)	less than 1.0
Phosphorus (P)	less than 0.04
Sulfur (S)	less than 0.04
Silicon (Si)	less than 1.0
Chromium (Cr)	4.75 to 5.75
Molybdenum (Mo)	0.45 to 0.65
Nickel (Ni)	2.75 to 3.50
Iron (Fe)	essentially balance

4,045,257

III(A)-V(B) TYPE LUMINESCENT DIODE

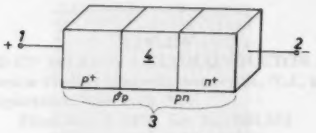
Ehrenfried Butter; Brigitte Jacobs; Klaus Jacobs; Konrad Unger; Alfred Zehe, all of Leipzig; Rainer Doss, and Florian Kugler, both of Teltow, all of Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Division of Ser. No. 282,190, Aug. 9, 1972, Pat. No. 3,911,462.
This application July 10, 1975, Ser. No. 594,900
Int. Cl.[2] H01L *33/00, 33/19*
U.S. Cl. 148—171 **1 Claim**

1. A method for producing a luminescent diode comprising providing a monocrystalline G_aA_s wafer substrate doped with a material of the group consisting of Si, Sn and Te, at a concentration of $N_D = 10^{18}$ atoms/cc, to be $n+$ conductive, then

depositing a small $p+$ layer on said substrate, by a liquid epitaxy process from a non-stoichiometric melt composed of GaAs, Ga, Al and Zn with a weight ratio of 1:4.6 to 4.76:0.015 to 0.028:0.03, by cooling at a rate of 0.5° to 10° C per minute from an initial temperature of about 930° C to a final temperature of about 780° C, whereby Z_n diffuses a short distance into the substrate during growth, to produce a structure of the form:

n^+-GaAs/p -GaAs/p^+-$Ga_xAl_{1-x}As$,



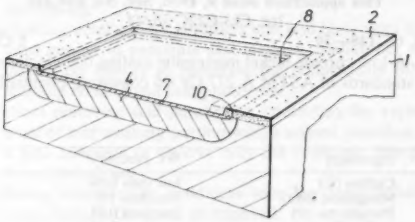
then subjecting the resultant structure, after separation from the melt solution, to a temperature process in a substantially hermetically closed system, at 900° C to 1000° C for 0.1 to 3 hours, in H_2 atmosphere, whereby the Z_n from the p+ region diffuses further into the substrate and results in an expanded light-emitting p-GaAs layer having an acceptor dopant profile with two dopant gradients, the greater of said gradients being toward said $p+$ region.

4,045,258

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Reinhold Kaiser, Heilbronn-Sontheim, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Jan. 31, 1975, Ser. No. 545,880
Claims priority, application Germany, Feb. 2, 1974, 2405067
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **8 Claims**



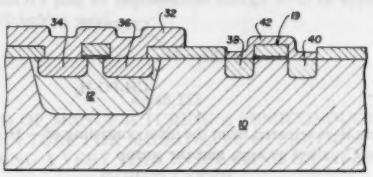
1. In a method of producing a semiconductor arrangement including applying a diffusion masking layer to one surface of a semiconductor body, forming a first semiconductor region of a first type of conductivity by opening a first diffusion window in said masking layer and diffusing said first semiconductor region into the semiconductor body via said window, forming a second semiconductor region of a second type of conductivity completely within said first semiconductor region so that the p-n junction between said first and second semiconductor regions extends to a portion of the semiconductor surface which is covered by said diffusion masking layer prior to and during said step of diffusing said first semiconductor region of the first type of conductivity, the improvement wherein said step of forming a second semiconductor region of the second type of conductivity comprises opening a second diffusion window in said masking layer which is greater than said first diffusion window for producing said semiconductor region of the first type of conductivity, and diffusing said second semiconductor region of the second type of conductivity into said first semiconductor region via said second diffusion window so that said second semiconductor region of the second type of conductivity is substantially thinner than said first semiconductor region of the first type of conductivity.

4,045,259

PROCESS FOR FABRICATING DIFFUSED COMPLEMENTARY FIELD EFFECT TRANSISTORS

Thomas J. Sanders, Indiatlantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Oct. 26, 1976, Ser. No. 735,285
Int. Cl.² H01L *21/225*
U.S. Cl. 148—188 **14 Claims**



1. In a process for fabricating complementary field effect transistors wherein source and drain apertures are provided through a first insulative layer superimposed on a substrate and each source and drain aperture are separated by a gate superimposed on said substrate, the improvement comprising:

forming unselectively a second insulative layer doped with N-type impurities;

selectively removing a portion of said second insulative layer to exposed apertures in which a P channel device is to be formed;

diffusing said N-type impurities from said second insulative layer into said substrate in a nonoxidizing atmosphere to form an N channel device; and

subsequently changing said nonoxidizing atmosphere to an atmosphere containing P-type impurities to diffuse P-type impurities through said exposed apertures to form said P channel device and further diffuse said N-type impurities.

4,045,260

EXPLOSIVE NITRAMINE SLURRY COMPOSITION

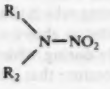
David Gordon Preston Start, Benoni, and John Thomas Francis Fenwick, Phalaborwa, both of South Africa, assignors to AE & CI Limited, Johannesburg, Transvaal, South Africa

Filed July 21, 1975, Ser. No. 597,838
Claims priority, application South Africa, July 19, 1974, 74/4617; July 19, 1974, 74/4618; July 19, 1974, 74/4619
Int. Cl.² C06B *45/00*
U.S. Cl. 149—2 **15 Claims**

1. An explosive slurry composition comprising a continuous phase and at least one nitramine sensitising component which is selected from the group consisting of

a. a primary nitramine of the formula R—NH—NO_2 wherein R represents a methyl, ethyl, propyl, isopropyl, butyl, isobutyl or tertbutyl group;

b. a secondary nitramine of the formula



wherein R_1 represents a methyl and R_2 represents methyl, ethyl, propyl or isopropyl group, or R_1 and R_2 are ethyl groups;

c. a primary dinitramine group of the formula

wherein *n* is 1, 2, 3 or 4; and

d. a salt of any of said nitramines or dinitramines wherein said composition contains 10–30% w/w of the nitramine sensitizing component.

4,045,261

MOLECULAR SIEVE CONTAINING STABILIZATION SYSTEM FOR URETHANE - CROSSLINKED DOUBLE BASE PROPELLANT

Robert J. Baczuk, Salt Lake City, Utah, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1976, Ser. No. 710,955
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.8 **3 Claims**

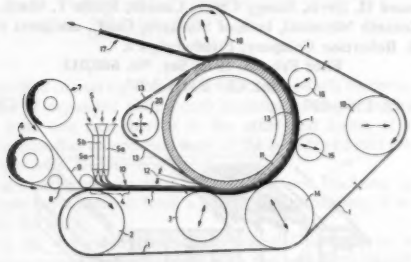
1. A solid urethane - crosslinked double base propellant comprising nitrocellulose, nitroglycerin, HMX, amonium perchlorate, aluminum, N-Methyl-p-Nitroaniline and aluminum silicate molecular sieve.

4,045,262

METHOD OF MAKING LAMINAR MATERIAL HAVING A BASE OF BONDED WOOD PARTICLES

Hans Joachim Enzinger, Oerlinghausen, Germany, and Hans Fechner, Kortrijk, Belgium, assignors to Feldmuhle Anlagen und Produktionsgesellschaft mit beschrankter Haftung, Dusseldorf-Oberkassel, Germany

Filed May 12, 1976, Ser. No. 685,909
Claims priority, application Germany, May 28, 1975, 2523670
Int. Cl.² B32B *31/00*; B05D *3/12*
U.S. Cl. 156—62.2 **10 Claims**



1. A process of producing a laminar material in continuous lengths which comprises:

a. sequentially and continuously moving a paper web through a loading zone and through a press zone,

1. said web consisting essentially of fibrous material impregnated with a synthetic resin composition, being free from sizing and filler, and having a permeability to water vapor of at least 1000 grams per square meter per day;

b. superimposing on said web in said loading zone loose wood particles intimately mixed with a bonding agent for said particles to form a layer on said web; and

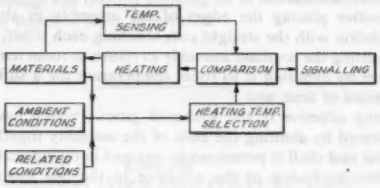
c. subjecting the web and the superimposed layer during said moving through said press zone to a temperature greater than 100° C and to a pressure sufficient to bond said loose particles to each other by said bonding agent in a dense structure and simultaneously to bond said particles to said web by at least one of said bonding agent and said synthetic resin composition.

4,045,263

CONTROL OF ROOFING PROCEDURE

Robert J. Moore, 614 Redman Ave., and Gerald B. Curtis, 50 Gill Road, both of Haddonfield, N.J. 08033

Division of Ser. No. 311,743, Dec. 4, 1972, Pat. No. 3,882,475.
This application Feb. 20, 1975, Ser. No. 551,094
Int. Cl.² E04D *7/00*
U.S. Cl. 156—64 **9 Claims**



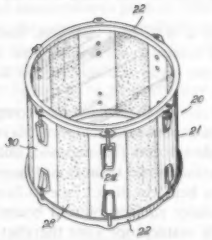
1. In formation of built-up roofs using molten bituminous material to adhere layers of roofing material, the improvement comprising heating bituminous material to melt it, sensing the temperature of the bituminous material being heated, sensing the temperature of molten bituminous material on the roof deck, and adjusting the heating temperature so that the temperature of the molten bituminous material applied to the deck will be within a predetermined satisfactory adhesion temperature range.

4,045,264

METHOD OF MANUFACTURING PLASTIC SHELLS FOR DRUMS

William F. Ludwig, Oak Brook, and Daniel S. Mikosz, Arlington Heights, both of Ill., assignors to Ludwig Industries, Chicago, Ill.

Filed Jan. 19, 1977, Ser. No. 760,564
Int. Cl.² B31C *5/00*
U.S. Cl. 156—63 **13 Claims**



1. A method of manufacturing plastic shells for drums from a plastic material which is relatively non-deformable at room temperature and is readily deformable when heated to a temperature substantially above room temperature, said method comprising steps of:

placing a large sheet of said plastic material on a substantially flat supporting surface when the material is at room temperature,

forming plastic panels from said plastic material by cutting it into individual panels,

forming a substantially V-shaped recess on one side of the sheet at said cut, which extends only partially through the panel,

forming a straight cut adjacent each V-shaped recess,

positioning the cut panels in abutting relation to each other

so that the V-shaped recesses face generally upwardly and the straight cuts of said adjacent panels abut with each other,

placing an adhesive having a higher deforming temperature than the temperature at which said plastic material becomes readily deformable to secure a desired plurality of said panels in an assembly,

removing excess adhesive from the assembly,

subjecting said assembly to a temperature at which said plastic material becomes readily deformable, but the adhesive material does not,

deforming the assembly into a generally cylindrical form while still heated,

thereafter placing the edges of the assembly in abutting relation with the straight cuts touching each other,

permitting the resultant assembly to return to room temperature by exposing it to room temperature for a sufficient period of time, and

placing adhesive in the V-shaped groove which has been formed by abutting the ends of the assembly together so that said shell is permanently retained in cylindrical form after hardening of the adhesive in the last mentioned V-shaped groove.

4,045,265

COMBINED APPLICATION PROCESS OF THERMAL INSULATION AND BUILT-UP ROOFING OR WATERPROOFING

Eiichi Tajima, and Kaname Yamamoto, both of Tokyo, Japan, assignors to Tajima Roofing Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,371
Claims priority, application Japan, Mar. 18, 1975, 50-31817
Int. Cl.[2] E04B *2/02*
U.S. Cl. 156—71 **11 Claims**

11. A process for manufacturing a combined, built-up, bituminous roofing or waterproofing and thermal insulation assembly, utilizing a base sheet having the entirety of one surface thereof covered with a compound coating layer consisting essentially of a pressure-sensitive self-adhesive composition that possesses high tackiness at ambient temperature, said compound layer being covered by a release paper having a release surface in releasably adhering contact with the outer surface of said compound layer and the other surface of said base sheet being free of said compound layer, comprising the steps of:

adhering, onto a wall of a building, foamed thermoplastic resin board means to form a thermal insulation layer on said wall, the outer surface of said board means being exposed;

removing the release sheet from said compound layer of said base sheet to expose said compound layer and then placing said base sheet onto the exposed outer surface of said foamed thermoplastic resin board means with said compound layer being in direct face-to-face adhering contact with said outer surface of said board means to form a substantially waterproof joint therebetween; and

then coating said outer surface of said base sheet with a layer of molten roofing bitumen.

4,045,266

PICTURE FRAMING METHOD AND KIT

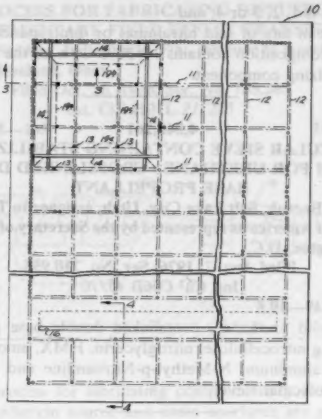
William T. Hewitt, Jr., 107-111 N. Main, Leland, Miss. 38756

Filed Sept. 12, 1975, Ser. No. 612,852
Int. Cl.[2] B32B *7/04*
U.S. Cl. 156—91 **8 Claims**

1. A method of assembling a picture frame from a plurality of picture frame segments having mitered corners, comprising:

a. providing a plurality of holes arranged in intersecting parallel rows and parallel columns in a flat board, and spacing said rows from each other and said columns from each other so that two frame segments may be placed between two sets of parallel rows of said holes and two other segments may be placed between two sets of parallel columns of said holes;

b. placing said two segments between said two sets of parallel rows and placing said other two segments between said two sets of parallel columns with the mitered corners of said segments abutting in the desired framing relationship;



c. inserting pegs in selected ones of said holes in said sets of parallel columns and said sets of parallel rows in abutting relationship to the edges of said frame segments and leaving the corners of said assembled frame segments free and unobstructed; and

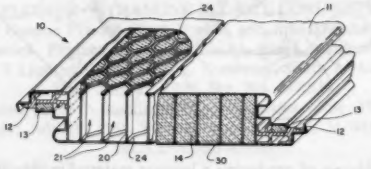
d. applying glue to said abutting corners of said frame segments.

4,045,267

METHOD AND APPARATUS FOR TACKING A HONEYCOMB CORE TO A BASE SHEET

Bernard H. Davis, Stoney Creek, Canada; Rollin T. Mack, and Kenneth Miyasaki, both of Stockton, Calif., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 660,013
Int. Cl.[2] B31D *3/02*
U.S. Cl. 156—197 **17 Claims**



1. In the method of making an insulated panel comprising tacking a base sheet to one face of an expanded core member, said expanded core member having plural open-ended cells and having coatings of adhesive, one provided on the ends of the cells on each face of said core member; filling the cells of said core member with thermal insulation; depositing a facing sheet on the other face of said core member in confronting relation with the coating of adhesive thereon; and curing the coatings of adhesive under pressure and by heating the coatings to the curing temperature of the adhesive, thereby to reliably bond said facing sheet and said base sheet to said core member; the improvement in the step of tacking said base sheet to said core member comprising:

engaging said core member with said sheet so that one said coating of adhesive contacts said base sheet while moving

said base sheet and said core member along a rectilinear path of travel; and

while engaging said base sheet with said core member,

a. heating said base sheet to temperatures within a wetting temperature range of the adhesive, said wetting temperature range being below the curing temperature of said adhesive,

b. maintaining said base sheet at temperatures within said wetting temperature range for a time interval sufficient to allow said one said coating of adhesive to be heated to flow, and to form a fillet between said core member and said base sheet, said time interval being insufficient to allow heating of the other said coating of adhesive to temperature within said wetting temperature range, and

c. rapidly cooling said base sheet and said one said coating of adhesive and the other coating of adhesive to a discharge temperature below said wetting temperature range, whereby a reliable temporary adhesive bond is formed between the ends of all of the cells and caps the cells on one face of said core member by a reliable temporary adhesive bond.

4,045,268

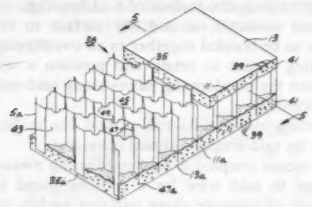
MASTIC COMPOSITION AND COMPOSITE STRUCTURAL PANELS FORMED THEREFROM

Robert C. Geschwender, Lincoln, Nebr., assignor to Bell Fibre Products Corporation, Marion, Ind. and Robert C. Geschwender, Lincoln, Nebr., part interest to each

Division of Ser. No. 491,677, July 25, 1974, Pat. No. 3,990,936, which is a division of Ser. No. 381,073, July 20, 1973, abandoned. This application May 6, 1976, Ser. No. 683,708

Int. Cl.[2] B31D *3/02*

U.S. Cl. 156—197 **23 Claims**



1. A method of making composite structural panels comprising a core of expanded honeycomb material having cells extending from one face thereof to the other and layers of a mastic composition on opposite faces of the core keyed into the ends of the cells, said method comprising:

feeding honeycomb material of predetermined thickness in compacted condition from a supply and expanding it to form the cells;

feeding the expanded honeycomb material forward on a predetermined horizontal path with the cells vertical and with the upper face of the honeycomb material spaced below an upper guide and the lower face of the honeycomb material spaced above a lower guide and with these guides being spaced a distance greater than the thickness of the expanded honeycomb material for travel of the expanded honeycomb material therebetween;

supplying a first web of mastic-backing material to travel rearward in a horizontal path above the upper guide and then forward below the upper guide and above the honeycomb material;

applying hardenable mastic material in a layer substantially thicker than one-half the difference between the spacing of the upper and lower guides and the thickness of the honeycomb material to the upper face of the first web as it travels rearward over the upper guide;

supplying a second web of mastic-backing material to travel forward in a horizontal path over the lower guide means;

applying hardenable mastic material in a layer thicker than one-half the difference between the spacing of the upper and lower guides and the thickness of the honeycomb material to the face of the second web which faces upward as the second web travels forward over the lower guide;

said guides being operable to press the mastic layers into the upper and lower ends of the cells of the honeycomb material to a depth less than the thickness of the mastic layers.

13. A method of making a composite structural panel comprising feeding an expanded honeycomb core having walls with openings therein between each cell and adjacent the opposite core faces, and concurrently pressing layers of hardenable mastic composition into the opposite core faces with the layers penetrating into each cell generally to the point of closing the openings and thereby trapping air in the cells to predetermine the depth of layer penetration.

4,045,269

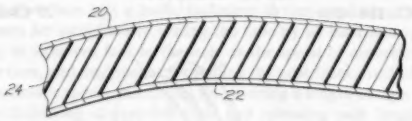
TRANSPARENT FORMABLE POLYURETHANE POLYCARBONATE LAMINATION

David Lehmann Voss, Chatsworth; William Albert Miller, Thousand Oaks, and Ralph David Hermansen, Northridge, all of Calif., assignors to Sierracin Corporation, Sylmar, Calif.

Filed Dec. 22, 1975, Ser. No. 643,247

Int. Cl.[2] B29C *19/00*

U.S. Cl. 156—221 **26 Claims**



1. A method for producing a curved transparent polycarbonate laminate from a polycarbonate sheet comprising the steps of:

a. preparing a substantially completely cured, rigid, transparent thermoset polyurethane sheet having a Shore D hardness less than about 70 and a tear strength greater than about 50 pli at temperatures greater than the temperature T_1, the polycarbonate sheet heat deflection temperature, and less than the temperature T_2, the polycarbonate sheet chain scission temperature;

b. thereafter directly bonding the polyurethane sheet to the polycarbonate sheet to produce a laminate wherein the polyurethane sheet is an outer layer of the laminate;

c. heating the laminate to at least T_1 and less than T_2; and

d. forming the laminate to a desired curvature.

4,045,270

METHOD OF AND APPARATUS FOR MAKING A NON-SLIP PLASTICS FILM

Jar-Erik Jofs, Vasa, Finland, assignor to Oy Wiik & Hoglund Ab, Finland

Filed Apr. 20, 1976, Ser. No. 678,543

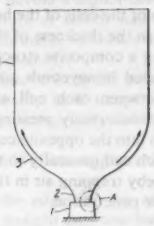
Claims priority, application Finland, Apr. 28, 1975, 751269

Int. Cl.[2] B32B *5/18*

U.S. Cl. 156—229 **8 Claims**

1. A method of making a plastic film having a rougher non-slip surface comprising the steps of simultaneously extruding at least two separate plasticized plastic materials so that two streams abut against one another and adhere to one another to

form a film having laminated layers defined by the material of said stream and stretching one of said layers relative to the



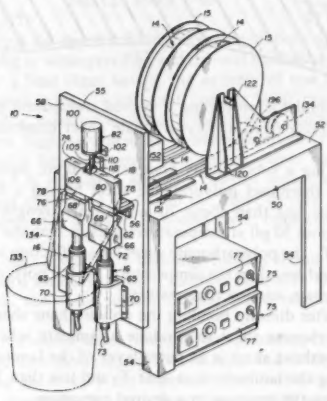
other layer whereby said other layer breaks to define a rougher surface on said stretched layer.

4,045,271

ULTRASONIC METHOD AND APPARATUS FOR MANUFACTURING BRASSIERE TAPES

Robert Alfred Clarke, White Plains; Peter J. Kuhl, Jackson Heights, and Richard H. Paschke, Medford, all of N.Y., assignors to Cavitron Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,786
Int. Cl.[2] B32B *31/10*
U.S. Cl. 156—366 **29 Claims**



1. Apparatus for forming tapes having a body portion and a pair of overlapping tabs extending outwardly therefrom, comprising

A. means for providing a continuous strip of said tape having elements thereon and layers of material in said body portion and in each of said tabs weldable with ultrasonic vibratory energy,

B. means for separating said tabs physically from each other and simultaneously maintaining said tabs in acoustical energy coupling relationship to each other, wherein said individual layers of material in said strip may be simultaneously severed and welded across said body portion and said tabs when interposed between an ultrasonically vibrating horn and an anvil, except for said layers of material in said tabs physically separated from each other, and

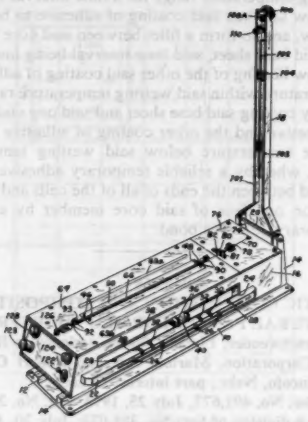
C. means for advancing said strip on an intermittent basis between said horn and said anvil for continuously producing said tapes of a desired number of elements.

4,045,272

APPARATUS FOR SEALING PLASTIC FILMS AND THE LIKE

Anthony Joseph Lombardi, Flanders, N.J., assignor to Barney Knitting Machinery Co., Inc., Brooklyn, N.Y.

Filed June 21, 1976, Ser. No. 698,189
Int. Cl.[2] B32B *19/02;* **B29C** *19/06*
U.S. Cl. 156—380 **14 Claims**



1. Sealing apparatus comprising in combination:

a housing supported on a base member;

a pressure arm member pivotally mounted to selectively exert pressure along one surface of said housing;

pin means mounted on said one surface to retain plastic pieces to be bonded together in an overlapping manner;

conducting means to retain and position a wire element between the overlapping pieces along said one surface of said housing;

wire cutting means mounted on said one surface and activated by said arm to cut said wire; and

control means coupled to said conducting means to apply a voltage to said wire for a predetermined time during exertion of pressure along said one surface to effect the bond between said pieces.

4,045,273

TAPE CUTTER PROTECTIVE GUARD MEANS FOR CARTON SEALING MACHINE TAPE APPLYING MECHANISM

Winton Loveland, 10 Timber Lane, Fort Salonga, N.Y. 11754, and Horst J. Hanemann, 175 Aldershot Lane, Manhasset, N.Y. 11030; Saul Warshaw, R.D. No. 1, Box 227, Hawley, Penn. 18428

Filed July 7, 1976, Ser. No. 703,213
Int. Cl.[2] B32B *31/00;* **B26D** *5/00;* **B31B** *1/60*
U.S. Cl. 156—486 **6 Claims**

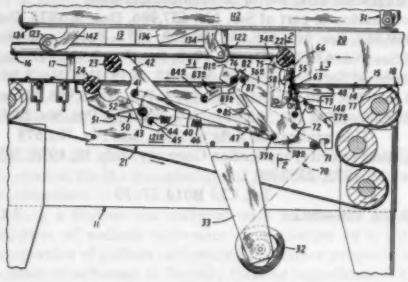
1. In a tape applying mechanism assembly of a carton sealing machine including movable tape cut-off means having a cutting edge, retractable guard means protectively covering the cutting edge when the cut-off means is in a projecting idle position, comprising,

1. a movable carrier that supports tape wipe-on means to be located in a path of advance of a carton through the machine and to be retractably moved by such advance;

2. manipulative tape cutter means having a cutting edge and additional movable carrier means supporting said cutter means for motion thereby of its cutting edge across a path of travel of the tape to the advancing carton for severance of the tape as the section of the latter of desired length is applied to the carton;

3. retractable guard means protectively covering the cutting edge when said cutter means is in a projecting idle position

intervening successive tape applying actions with said guard means being carried by swinging arm means pivotally supported on frame structure of said tape applying mechanism assembly; and



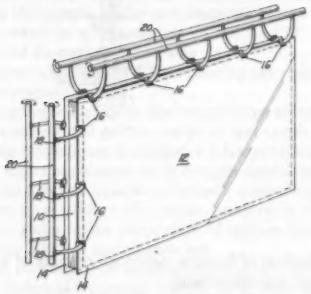
4. means linking said guard carrying swinging arm means to said movable carrier supporting the tape wipe-on means to retract said guard means for uncovering said cutting edge while the carton advances past the tape wipe-on means.

4,045,274

APPARATUS FOR SURFACE TREATMENT OF WOODEN PANELS

Wolfgang Lange, and Werner Schafer, both of Essen, Germany, assignors to Becker & Van Hullen, Niederrheinische Maschinen Fabrik, Krefeld, Germany

Division of Ser. No. 491,104, July 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 286,401, Sept. 5, 1972, abandoned. This application Mar. 1, 1976, Ser. No. 662,683
Claims priority, application Germany, Sept. 4, 1971, 2144347
Int. Cl.² B30B *7/00, 15/34*
U.S. Cl. 156—492 **2 Claims**



1. Apparatus for applying a sheet impregnated with heat-sensitive, hardenable synthetic resin to at least one surface of a wooden panel, in which the sheet is attached to the panel solely along the corner edges formed by the intersection of the face plane of the panel with the perpendicular edge planes along the longitudinal and transverse edges of the panel, said apparatus comprising:

a plurality of narrow, individual flat-faced heating platens spaced apart from one another along the length of the edge of the panel, said individual platens being mounted on arms projecting from a rotatable shaft that is rocked through an angular distance to bring the platens into contact with the sheet;

said individual platens being moved simultaneously into contact with the sharp corner edge of the panel so as to bend the edge of the sheet over the corner edge of the panel and apply pressure and heat to the sheet solely along a plurality of longitudinally spaced, linear contact areas substantially limited to the corner edge;

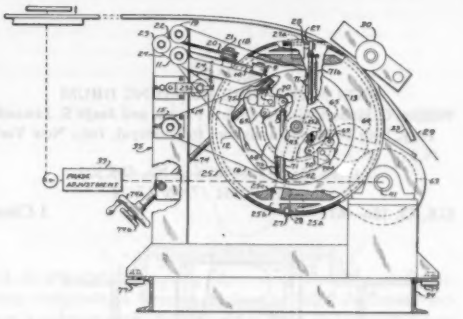
said flat faces of said heating platens forming substantially 45° angles with the face planes of the panel and with said edge planes.

4,045,275

MACHINE FOR APPLYING TAPES TO MOVING PRODUCT

Roger H. Stohlquist, 2002 Homewood Drive, Rockford, Ill. 61107, and John B. Bartell, 1227 N. Race Ave., Arlington Heights, Ill. 60004

Filed Sept. 4, 1975, Ser. No. 610,461
Int. Cl.² B32B *31/00*
U.S. Cl. 156—521 **7 Claims**



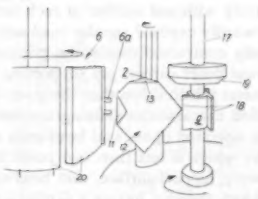
1. Apparatus for applying to a moving item a tape having an adhesive face and a back, including driven applicator wheel means for peripherally seizing the tape by its back and applying its adhesive face to the item at the speed of movement of the item, and feed means for pulling the tape from a roll of tape at a slower speed, and means for severing a length of tape from the foilowing slower-fed tape and releasing said length to control of the applicator wheel means to accept the peripheral speed of the applicator wheel means for application to the item; said applicator wheel being carried in a subframe pivotable about a drive shaft and adjustable as to the angular position about the axis of said shaft for properly positioning varied sizes of applicator wheels to a given item path; said drive shaft driving said applicator wheel.

4,045,276

APPARATUS FOR APPLYING FOIL LABELS TO CONTAINERS

Rudolf Zodrow, Dusseldorf, Germany, assignor to Jagenberg Werke Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 16, 1976, Ser. No. 723,833
Claims priority, application Germany, Oct. 7, 1975, 2544785
Int. Cl.² B29C *17/00*
U.S. Cl. 156—571 **7 Claims**



1. In an apparatus for applying to a container labels having a plurality of points, comprising a rotating support, a rotating element on said support for picking up a foil label from a supply and for moving said label with a point thereof projecting horizontally and another point projecting vertically, first means for folding over said horizontally projecting point as

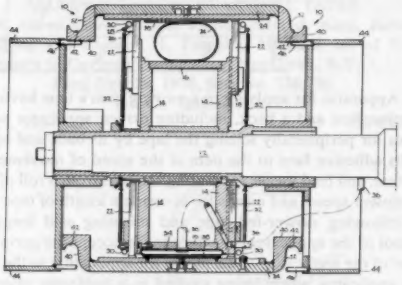
said rotating pickup element carries said label past a folding station, and a rotating gripper element receiving said label from said pickup element and gripping it where folded over, the improvement which comprises a second means for folding over said vertically projecting point after said pickup element picks up said label from said supply, whereby a more neat wrap will be produced when said label is applied to a container to be wrapped thereabout.

4,045,277

PNEUMATIC TIRE BUILDING DRUM

William C. Habert, Grosse Pointe Farms, and Jasjit S. Jawanda, Troy, both of Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed May 11, 1976, Ser. No. 685,203
Int. Cl.[2] B29H *17/16, 17/22*
U.S. Cl. 156—417 **3 Claims**



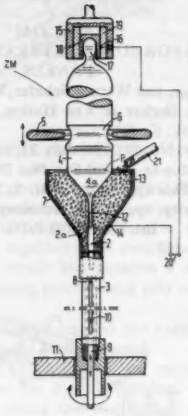
1. A building drum for building a first-stage, steel-reinforced, radial monoply, pneumatic tire carcass, whereby two specified carcass-bead-defining annular metallic cores are secured to the opposite end portions, respectively, of a cylindrically-oriented carcass-monoply, said drum comprising a circumferential array of drumforming segments, guide means supporting said segments for radial displacement to and from contracted and expanded dispositions, and shifting means for displacing said segments radially between said contracted and expanded dispositions, each of said segments having the same axial extent and terminating at each end in a respective flange projecting radially inwardly, each of said flanges having a respective recess exposed radially outwardly, corresponding ones of said recesses which are at the same segment end defining cooperatively with one another at each such segment end a radially outwardly exposed annular bead-seat, said segments when in a fully contracted disposition presenting a substantially cylindrical outer carcass-ply supporting surface having an outer diameter which is less than the inner diameter of any of said specified carcass-bead-defining annular metallic cores to be thereby operated upon, said bead-seats each having an inner diameter which is less than said outer diameter of said outer carcass-ply support-surface, said bead-seats each being entirely rigid and, thereby, having a depth-to-width ratio that does not vary with the expansion and contraction of said segments, the depth of each of said bead-seats measured radially from said outer carcass-ply support-surface to the radially innermost portion of said bead-seats being in excess of three times the radially directed thickness of any of said specified carcass-bead-defining annular metallic cores to be thereby operated upon.

4,045,278

METHOD AND APPARATUS FOR FLOATING MELT ZONE OF SEMICONDUCTOR CRYSTAL RODS

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 637,986, Dec. 5, 1975, Pat. No. 3,989,468, Ser. No. 638,261, Dec. 8, 1975, Pat. No. 3,996,096, and Ser. No. 638,302, Dec. 8, 1975, Pat. No. 3,996,011, each is a division of Ser. No. 580,548, May 27, 1975, Pat. No. 3,961,906, and Ser. No. 580,585, May 27, 1975, Pat. No. 3,988,197, each is a division of Ser. No. 525,641, Nov. 20, 1974, Pat. No. 3,923,468.
This application July 6, 1976, Ser. No. 702,575
Claims priority, application Germany, July 11, 1975, 2531099; Nov. 22, 1973, 2358300
Int. Cl.[2] B01J *17/10*
U.S. Cl. 156—602 **7 Claims**



1. A method of floating melt zone refining of a semiconductor crystal rod comprising:

arranging a semiconductor crystal rod within a floating zone melt environment with a seed crystal attached to a lower end thereof;

generating a melt zone at the juncture of said seed crystal and said rod and controllably moving said melt zone away from said juncture through said rod to a select point on such rod;

uniformly supporting said lower end of said rod so as to prevent oscillations at the juncture of said crystal and said rod by axially upwardly moving a conductive hollow funnel-shaped jacket from a position below said juncture to a position surrounding said lower end of the rod, said jacket including a conductive stabilizing means therein;

establishing operational contact between an electrical current source, said jacket and an upper end of said rod;

feeding an electrical current through said jacket and stabilizing means through the rod so that said electrical current passes from said jacket across said melt zone; and

controllably moving said melt zone from said select point on the rod through the remaining portions of said rod.

4,045,279

PROCESS FOR THE MANUFACTURE OF PULP USING SODIUM CARBONATE AND OXYGEN

Tadashi Nagano, Tokyo; Saisei Miyao, and Katsuhiko Takeda, both of Kure, all of Japan, assignors to Toyo Pulp Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 534,347, Dec. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,685, Dec. 22, 1972, abandoned. This application Sept. 9, 1976, Ser. No. 722,000

Claims priority, application Japan, Jan. 17, 1972, 47-6728

Int. Cl.[2] D21C *3/02*

U.S. Cl. 162—25 5 Claims

1. A process for the manufacture of pulp in a closed system, which comprises

1. mixing a fibrous raw material with an alkaline aqueous solution of sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients, which alkaline aqueous solution is completely free of sulfite and sulfide compounds and sulfur-containing ions resulting from dissolution of said compounds, the amount of sodium carbonate or mixture of sodium carbonate and sodium bicarbonate being 5 – 20% by weight, as sodium oxide, based on the weight of the raw material,
2. pre-cooking the fibrous raw material in the alkaline aqueous solution at a temperature of 90° to 190° C,
3. defibrating the pre-cooked material by mechanical means,
4. removing a major proportion of waste liquor, formed during the pre-cooking step, from the defibrated material,
5. pulping the defibrated material in an alkaline aqueous solution of sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients, which alkaline aqueous solution is completely free of sulfite and sulfide compounds and sulfur-containing ions resulting from dissolution of said compounds, the amount of sodium carbonate or mixture of sodium carbonate and sodium bicarbonate being 5 – 20% by weight, as sodium oxide, based on the weight of the raw material, in a pressurized pulping vessel at a temperature of 90° to 170° C in the presence of an oxygen-containing gas,
6. discharging waste liquor, formed during the pulping step, from the pulping vessel,
7. subjecting the waste liquor discharged from at least one of the pre-cooking and pulping steps to wet combustion, in which the waste liquor is treated at a temperature exceeding 230° C in the presence of an oxygen-containing gas, to recover an alkaline aqueous substance containing sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients and
8. recycling the recovered alkaline aqueous substance, without any chemical treatment thereof, to at least one of the pre-cooking and pulping steps.

4,045,280

ALKALINE PULPING OF LIGNOCELLULOSIC MATERIAL WITH AMINE AND NITRATE PRETREATMENT

David M. Mackie, Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Feb. 17, 1976, Ser. No. 658,868

Int. Cl.[2] D21C *3/02, 3/04, 3/20*

U.S. Cl. 162—65 10 Claims

1. In a process for pulping raw lignocellulosic material, the steps which comprise first pretreating the lignocellulosic material with an aqueous solution containing from about 0.1 to 10% by weight of a water soluble, low molecular weight aliphatic amine selected from the group consisting of monoethanolamine and methylamine and from about 0.01 to 1% by weight of a water soluble transition metal salt selected from the group consisting of copper nitrate and nickel nitrate at elevated pressure in a closed vessel and thereafter subjecting the pretreated lignocellulosic material to an alkaline pulping process in the absence of oxygen.

4,045,281

METHOD FOR PREVENTING WEB REWETTING

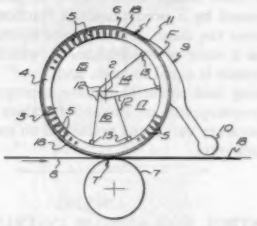
Eberhard Wassermann, Sheffield, England, assignor to Sulzer Bros. (U.K.) Limited, Farnborough, England

Filed July 28, 1975, Ser. No. 599,394

Claims priority, application United Kingdom, Aug. 7, 1974, 34898/74

Int. Cl.[2] D21F *1/60*

U.S. Cl. 162—214 3 Claims



1. In a method of making paper using a paper making machine comprising a forming medium having a perforated surface, a pressure slice adjacent said surface, and a transfer zone from which a formed web is withdrawn, and wherein the withdrawn web is exposed to water thrown out from a length of said forming medium extending between said transfer zone and said pressure slice in a direction of movement of said medium, comprising the steps of moving said medium, supplying paper stock material from said pressure slice to said medium in a forming zone during movement of said medium, producing suction at said medium at the transfer zone thereof, withdrawing the formed web from said medium at the transfer zone, water from said moving medium tending to impinge on said withdrawn web, the additional step of producing suction at said medium along substantially the entire length of said medium extending between the transfer zone and the pressure slice in the direction of movement of said medium so as to prevent rewetting of said withdrawn web.

4,045,282

METHOD AND A DEVICE FOR THERMAL MONITORING OF A NUCLEAR REACTOR CORE

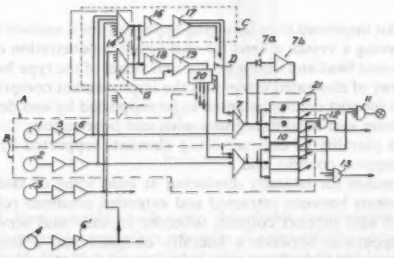
Georges Barbier, Aix-en-Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 26, 1976, Ser. No. 661,756

Claims priority, application France, Mar. 4, 1975, 75.06746

Int. Cl.[2] G21C *7/00*

U.S. Cl. 176—19 R 6 Claims



1. A method of thermal monitoring of a nuclear reactor core having fuel assemblies at temperatures T_1 and T_2 utilizing

coolant temperatures detected at the outlets of a plurality of said fuel assemblies comprising the steps of

establishing at each instant the mean core outlet temperature by forming the half-sum of the mean T_1 and T_2 core outlet temperatures corresponding respectively to the mean value of the coolant temperatures at the outlet of at least part of the fuel assemblies at temperatures T_1 and to the mean value of the coolant temperatures at the outlet of at least part of the fueld assemblies at temperatures T_2 and the difference between said core outlet temperatures T_1 and T_2,

producing for each fuel assembly an analog signal corresponding to the temperature difference between the coolant temperature at the outlet of said fuel assembly and the mean core outlet temperature as initially increased or decreased by a predetermined fraction of the difference between the mean core outlet temperatures T_1 and T_2 to define a state of equilibrium at which said temperature difference is equal to zero, and

processing said signal to initiate appropriate safety actions by overstepping of threshold values corresponding to temperature variations permitted on each side of the equilibrium zero.

4,045,283

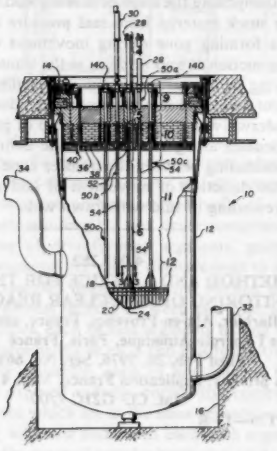
CONTROL ROD AND/OR INSTRUMENT TREE ASSEMBLY

Richard Croissant Noyes, Hartford, Conn.; Clive Frederick George Dupen, Encinitas; Donald Martin Barrus, Poway, both of Calif., and Edward Arnold Siegel, Bloomfield, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 30, 1974, Ser. No. 537,283

Int. Cl.[2] G21C *7/08*

U.S. Cl. 176—35 **9 Claims**



1. An improved core servicing apparatus for a nuclear reactor having a vessel, a head for said vessel, a penetration opening in said head and a core within said vessel of the type having an array of elongated assemblies the improvement comprising:

a. a support column adapted to be supported by and depend from said head in registry with said penetration;

b. a plurality of core servicing elements supported by said support column; and

c. means for laterally displacing at least some of said elements between retracted and extended positions relative to said support column, whereby to vary said servicing apparatus between a laterally compact and a laterally expanded configuration, said laterally displaceable elements each including an elongated resilient drive cable extending upwardly therefrom and said lateral displacement means including a guide channel means for each of said elements and associated drive cables, said guide channel means being supported by said support column and extending generally vertically and being directed laterally outward at its lower end, said drive cables being longitudinally movable to move said elements between a position in said channel means and a position laterally outward thereof beyond said lower end.

4,045,284

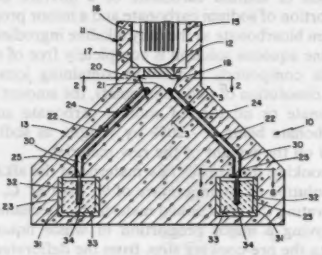
NUCLEAR REACTOR FUEL CONTAINMENT SAFETY STRUCTURE

Michael P. Rosewell, 5155 S. Natchez Ave., Chicago, Ill. 60638

Filed Mar. 10, 1975, Ser. No. 556,692

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—38 **1 Claim**



1. A nuclear reactor fuel containment safety structure for fuel of an atomic reactor in a primary containment and capable of heating to melt down temperatures if not properly cooled, and having means normally provided for cooling of the fuel comprising a fuel reactor shield having a fuel containment chamber adapted to contain the atomic reactor and reactor fuel therein, said fuel chamber having an exhaust passage means in the bottom thereof adapted to allow passage of a radioactive molten mass therethrough from said fuel chamber; a deactivating containment base attached to and extending generally downwardly from said fuel reactor shield at said exhaust passage means of said chamber for receiving any radioactive fuel flow from said chamber, whereby a molten radioactive mass formed by said reactor in said fuel reactor shield will pass into said deactivating containment base to be deactivated; said deactivating base has remotely located diffusing means for receiving a radioactive means flowing thereinto from said fuel chamber through said exhaust passage to diffusibly separate said fuel into remotely located parts to reduce the temperature of the mass, whereby a molten radioactive mass formed by said reactor in said fuel reactor shield will pass into said deactivating containment base to be dispersed to cool said mass; said deactivating base has flux material infusing means and poison control substance adapted to receive the dispersed flowing radioactive masses whereby said masses will be further cooled as a result of the fluxing action and the action of the poison control substance infused into the mass by the fluxing material; said flux material is positioned in said dispersing means for receiving the flowing radioactive mass to be infused therein for further cooling said mass, said diffusing means comprises a dispersion manifold chamber below said passage means for receiving fuel flow thereinto said chamber having a fuel receiving dome with the surface thereof centered below said passage means and being larger at its base than at the top thereof whereby fuel flowing thereonto, will flow downwardly thereover and therearound to diffuse said fuel around the base of said receiving dome; said diffusion means comprises multiple spaced apart passages extending radially outwardly and downwardly from said dispersion manifold chamber at the base of said dome for receiving fuel flow from said dome to further diffuse said fuel into said passages to further cool said fuel; wherein fluxing means is positioned in said dispersion

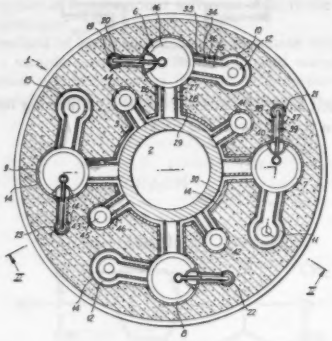
passages for receiving said fuel and to infuse therewith to cool said fuel; and said fluxing means includes soluble melt plugs in said passages to temporarily stop flow of said fuel as said plugs are dissolved or melted causing a temporary backup of fuel to balance the fuel load in each diffusion passage.

4,045,285

PLANT FOR THE PRODUCTION OF HYDROGEN THROUGH UTILIZATION OF HEAT ENERGY OBTAINED FROM A GAS-COOLED NUCLEAR REACTOR

Heinrich Baumgaertner, Ketsch, and Ekkehard Barchewitz, Mannheim, both of Germany, assignors to Hochtemperatur-Reactorbau GmbH., Mannheim, Germany

Filed Nov. 21, 1975, Ser. No. 634,052
Claims priority, application Germany, Nov. 23, 1974, 2455508
Int. Cl.[2] G21D *9/00*
U.S. Cl. 176—39 **11 Claims**



1. A plant for the production of hydrogen through utilization of heat energy derived from a gas-cooled, high-temperature nuclear reactor, comprising:

a. a thick-walled vessel;

b. a high temperature reactor contained in a centrally oriented cavity with said vessel;

c. a plurality of process gas cracking reactors contained within the wall of said vessel;

d. a plurality of steam generators equal to the number of said gas cracking reactors, said generators being contained in the wall of said vessel;

e. a plurality of recuperative heat exchangers equal to the number of said gas cracking reactors each of said heat exchangers being contained within the wall of said vessel and being positioned closely adjacent one of said gas cracking reactors;

f. a coaxial conduit connecting said adjacent heat exchanger and gas cracking reactor pairs; and

g. a coaxial conduit connecting said gas cracking reactor and steam generator pairs; whereby said coaxial donduits transport cooling gas through the exterior space therein.

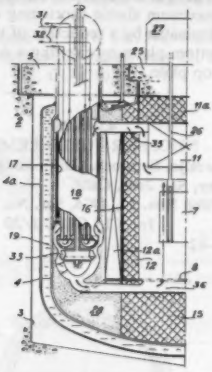
4,045,286

MOLTEN FUEL-SALT REACTOR

Jacques Marcel Blum, Levallois Perret; Michel Grenon, Neuilly-sur-Seine, and Edmond Ventre, Le Vesinet, all of France, assignors to Electricite de France (Service National) and Pechiney Ugine Kuhlmann, both of Paris, France

Filed Dec. 22, 1975, Ser. No. 642,996
Claims priority, application France, Dec. 24, 1974, 74.42767; Nov. 17, 1975, 75.35055
Int. Cl.[2] G21C *3/54*
U.S. Cl. 176—49 **4 Claims**

1. A molten-salt reactor provided within a common vessel containing the reactor core and a neutron-moderating mass pierced by passages for the circulation of the molten fuel salt with at least one primary heat exchanger which is located as close as possible to the reactor core and through which the hot fuel salt passes immediately after discharge from said core and with pumps for circulating the cold molten fuel salt which is discharged from the heat exchangers and returned into the reactor core, wherein the free spaces defined within the reactor vessel exterior of and between the core, the heat exchangers and the pumps are filled with expanded graphite which is



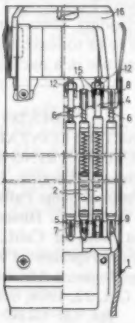
compatible with the molten fuel salt except for the connecting passages in which the fuel salt is circulated, wherein the reactor core is placed within the central portion of an open vessel having a vertical axis and is surrounded by a lateral reflector which defines an annular region with the internal vessel wall, the pumps for the circulation of molten fuel salt and the heat exchangers being placed within said annular region, said pumps and said heat exchangers being disposed at intervals around said reactor core.

4,045,287

FUEL ASSEMBLY WITH EASILY DETACHABLE COMPONENTS

Aart van Santen, Vasteras, Sweden, assignor to Aktiebolaget ASEA-ATOM, Vasteras, Sweden

Filed Dec. 22, 1975, Ser. No. 643,512
Claims priority, application Sweden, Dec. 30, 1974, 7416341
Int. Cl.[2] G21C *3/30, 3/10*
U.S. Cl. 176—78 **1 Claim**



1. Fuel assembly with easily detachable components, which fuel assembly comprises a bundle of substantially vertical fuel rods **(2, 3)** which are provided with upper **(4,6)** and lower **(5,7)** end plugs, a bottom plate **(9)** and a grid-formed top plate **(8)** provided with attachment holes for said upper end plugs, compressible individual springs **(11)** surrounding some of said

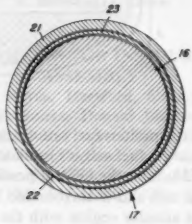
upper plugs, a plurality of fuel rods (3) having their lower end plugs (5) screwed in threaded holes (10) in said bottom plate, the upper end plugs (4) each having a portion located above said top plate and provided with a nut (12), means limiting the rotational movement of the nut (12) comprising at least one downwardly-directed nut projection (13), the end surface of which lies below the upper edge of a side (14) of the grid of the top plate (8), said grid side running between two attachment holes, and the length of said projection being, at the most, equal to the maximum elastic shortening of said compressible springs (11) obtainable by a reduction of the distance between the top and bottom plates by exerting a downwardly-directed force on the top plate.

4,045,288

NUCLEAR FUEL ELEMENT

Joseph Sam Armijo, Saratoga, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Nov. 11, 1974, Ser. No. 522,766
Int. Cl.² G21C *3/20*
U.S. Cl. 176—82 **19 Claims**



1. A nuclear fuel element comprising (a) a central core of a body of nuclear fuel material selected from the group consisting of compounds of uranium, plutonium, thorium and mixtures thereof and (b) an elongated composite cladding container including an outer portion formed of a material selected from the group of zirconium and zirconium alloys and forming a substrate, an undeformed metal barrier of constant thickness formed of a material selected from the group of niobium, aluminum, copper, nickel, stainless steel and iron metallurgically bonded on the inside surface of the substrate, said metal barrier comprising from about 1 to about 4 percent of the thickness of the cladding container and an undeformed inner layer of constant thickness formed of zirconium metallurgically bonded on the inside surface of the metal barrier, said inner layer comprising from about 5 to about 15 percent of the thickness of the cladding container, said cladding container enclosing said core so as to leave a gap between said core and said cladding during use in a nuclear reactor.

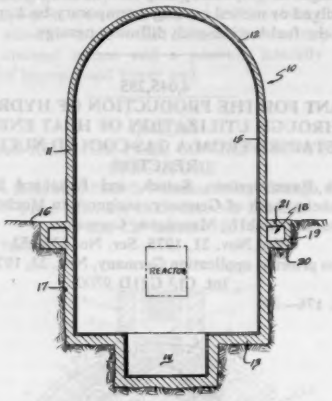
4,045,289

NUCLEAR REACTOR CONTAINMENT STRUCTURE WITH CONTINUOUS RING TUNNEL AT GRADE

Ralph W. Seidensticker, Wheaton, Ill.; Robert L. Knawa; Bernard C. Cerutti, both of Idaho Falls, Idaho; Charles R. Snyder, Naperville, Ill.; William C. Husen, Whittier, and Robert G. Coyer, Pasadena, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,837
Int. Cl.² G21C *13/02*
U.S. Cl. 176—87 **2 Claims**

1. A containment structure for a nuclear reactor comprising a vertically disposed, right circular cylindrical shell provided with a top dome and resting on a base mat, said shell, dome and base mat being constructed of steel-lined reinforced concrete, said structure being partially embedded in competent rock with the concrete thereof being in contact with the rock and including a hollow, reinforced-concrete ring tunnel continuously encircling said cylindrical shell and surrounding the shell with its top at grade, having one wall integral with the cylindrical shell, and with at least the base of the ring tunnel being poured in contact with the rock.



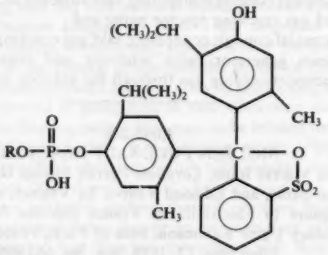
4,045,290

DIAGNOSTIC METHOD AND COMPOUNDS FOR USE THEREWITH

George F. Bulbenko, Langhorne, Pa., and Joseph Eliot Woodbridge, Princeton, N.J., assignors to Princeton Biomedix Incorporated, Princeton, N.J.

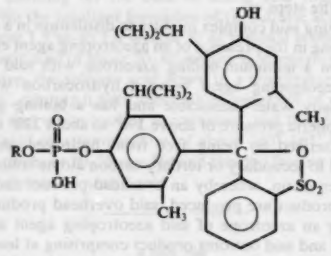
Continuation-in-part of Ser. No. 554,007, Feb. 28, 1975, abandoned. This application Feb. 18, 1976, Ser. No. 659,002
Int. Cl.² G07F *3/02*; C09K *15/26*
U.S. Cl. 195—99 **9 Claims**

1. Compounds useful in the assay of alkaline phosphatase enzymes comprising a compound having the structure



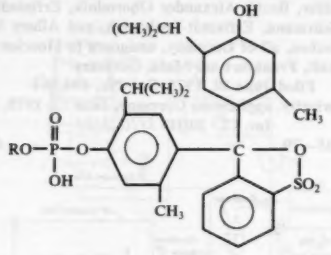
wherein R is selected from the group consisting of sodium, potassium, ammonium, 2 -amino-2-methyl 1,3-propanediol, dicyclohexylamine, cyclohexylamine and tris(hydroxymethyl) amminomethane.

3. A composition for the assay of alkaline phosphatase enzymes comprising a compound having the structure



wherein R is selected from the group consisting of sodium, potassium, ammonium, 2 -amino-2-methyl 1,3-propanediol, dicyclohexylamine, cyclohexylamine and tris(hydroxymethyl) aminomethane, a phosphorylatable buffer in an amount sufficient to produce a pH of about 10.2 and an activator for alkaline phosphatase in an amount sufficient to activate said alkaline phosphatase.

7. A method of assaying alkaline phosphatase enzymes present in a sample comprising contacting said sample with a composition which releases a dyestuff at a measurable rate, said composition comprising a compound having the structure



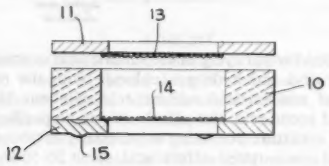
wherein R is selected from the group consisting of sodium, potassium, ammonium, 2-amino-2-methyl 1,3-propanediol, dicylohexylamine, cyclohexylamine and tris(hydroxymethyl) aminomethane, a phosphorylatable buffer in an amount sufficient to produce a pH of about 10.2 and an activator for alkaline phosphatase enzymes in an amount sufficient to activate said enzymes and spectrophotometrically measuring the rate of formation of dye.

4,045,291

TISSUE SPECIMEN CONTAINER

Jacob E. Berger, 4444 Main St., Snyder, N.Y. 14226

Filed July 15, 1976, Ser. No. 705,416
Int. Cl.[2] C12K *1/10*
U.S. Cl. 195—127 **7 Claims**



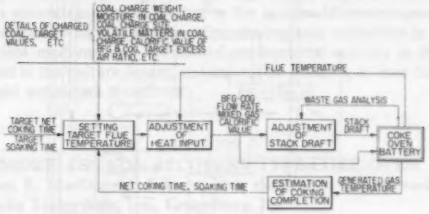
1. A tissue specimen container comprising a tubular body member means and closure means adapted to extend across the opposite ends of said body member means in axial abutment therewith to form a tissue specimen receiving chamber, at least one of said means comprising permanent magnet means and the other of said means being magnetically attractable thereto whereby the container is releasably held in closed assembly by axially directed magnetic force.

4,045,292

METHOD FOR CONTROLLING COMBUSTION IN COKE OVEN BATTERY

Taro Matsushita, Fukuyama; Masahiro Hiraki, Fukayasu; Takeo Fujimura, Yokohama, and Shinji Hasebe, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 30, 1976, Ser. No. 701,150
Claims priority, application Japan, July 21, 1975, 50-88430
Int. Cl.[2] C10B *21/10*
U.S. Cl. 201—1 **4 Claims**


COAL CHARGE WEIGHT, MOISTURE IN COAL CHARGE, COAL CHARGING TIME, VOLATILE MATTERS IN COAL CHARGE, CALORIFIC VALUE OF FUEL GAS, TARGET EXCESS AIR RATIO, ETC.
DETAILS OF CHARGED COAL, TARGET VALUES, ETC.
FLUE TEMPERATURE
WASTE GAS ANALYSIS
TARGET NET COKING TIME
TARGET SOAKING TIME
SETTING TARGET FLUE TEMPERATURES
ADJUSTMENT OF HEAT INPUT
BFG GOG FLOW RATE, MIXED GAS CALORIFIC VALUE
ADJUSTMENT OF STACK DRAFT
STACK DRAFT
COKE OVEN BATTERY
NET COKING TIME, SOAKING TIME
ESTIMATION OF COKING COMPLETION
GENERATED GAS TEMPERATURE

1. A method for controlling the combustion by oven group in the operation of a coke oven battery which comprises the steps of:

setting a target flue temperature for each oven group on the basis of the details of coal charge consisting of the weight, the particle size, the moisture content, the volatile matter content and the timing of charging of the coal charge, so as to achieve a target net coking time and a target soaking time given by a coke production schedule; measuring the temperature at the hairpin tops of individual flues at certain intervals of time; calculating deviations of thus measured flue temperatures from said target flue temperature by computer to set a flow rate and a calorific value of the fuel gas for each oven group with the use of said deviations; setting a stack draft for each oven group by computer so as to ensure optimum combustion in response to changes in the flow rate and the calorific value of the fuel gas, and simultaneously adjusting said stack draft by means of a measured excess air ratio obtained by analyzing the combustion waste gases from the flues and a target excess air ratio; and bias-correcting said target flue temperature with reference to the mean value of the measured flue temperatures, the measured net coking times, the measured soaking times and the details of coal charge corresponding thereto.

4,045,293

WATER PURIFICATION APPARATUS AND METHOD

Ralph D. Cooksley, Apt. 543, South Tower, 1800 Silas Deane Highway, Rocky Hill, Conn. 06067

Filed Nov. 6, 1975, Ser. No. 629,273
Int. Cl.[2] B01D *3/02*
U.S. Cl. 203—10 **21 Claims**

1. In a water purification apparatus, the combination comprising:

A. a boiler assembly having

1. a water-boiling tank portion and
2. a vapor receiving and conducting portion thereabove, said tank portion including a first chamber, a water inlet into said chamber and heating means adapted to heat water in said chamber to the boiling point and produce vaporization thereof,

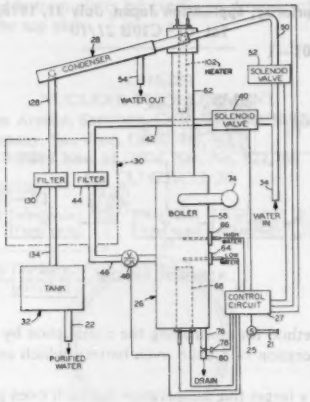
said vapor-receiving and conducting portion including

a. a second chamber therewithin,

b. contact surface means occupying substantially the entire transverse dimension of at least a portion of the length of said second chamber and

c. heating means for heating said contact surface means to a temperature substantially above the vaporization temperature of water to effect vaporization of water particles which may come into contact therewith,

said boiler assembly including a passage between said first chamber and said second chamber for passage of vapors from said first chamber to said second chamber;



B. a condenser assembly connected to said vapor-receiving and conducting portion for receiving vapors passing therethrough and providing indirect heat exchange contact between the vapors and a cooling medium;

C. a filter assembly connected to said condenser assembly for receiving condensate therefrom and effecting filtration thereof; and

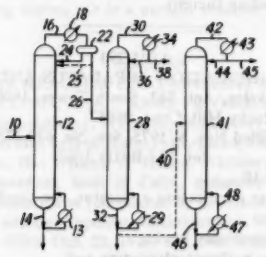
D. storage tank means for receiving filtrate from said filter assembly.

4,045,294

PROCESS FOR THE RECOVERY OF ALKYLENE GLYCOLS

Mitchell Becker, Teaneck, and Jon R. Valbert, Ridgewood, both of N.J., assignors to Halcon International, Inc., New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,824
Int. Cl.² B01D 3/36; C07C 29/28
U.S. Cl. 203—69 **4 Claims**



1. A process for recovering ethylene glycol or propylene glycol characterized by low ultraviolet absorbance from a complex mixture comprising propylene glycol or ethylene glycol in admixture with at least one mono-lower carboxylate ester and at least one di-lower carboxylate ester of said propylene glycol or ethylene glycol, said glycol and said esters tending to form azeotropic mixtures among themselves, which comprises the steps of:

a. subjecting said complex mixture to distillation in a distillation zone in the presence of an azeotroping agent effective to form a minimum-boiling azeotrope with said glycol, said azeotroping agent being a hydrocarbon which is essentially water-immiscible and has a boiling point at atmospheric pressure of above 190° to about 220° C and is characterized by being free from hydrogen atoms attached to secondary or tertiary carbon atoms contained in an open chain, whereby an overhead product and a bottoms product are produced, said overhead product comprising an azeotrope of said azeotroping agent and said glycol and said bottoms product comprising at least some of the esters in said mixture substantially reduced in glycol content;

b. separating said overhead product into a first phase comprising said azeotroping agent and a second phase comprising said glycol;

c. returning said first phase to said distillation zone as reflux; and

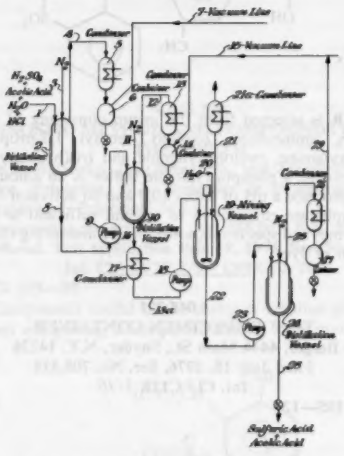
d. recovering purified glycol characterized by low ultraviolet absorbance from at least part of said second phase.

4,045,295

PURIFICATION OF SULFURIC ACID CONTAINING ACETIC ACID

Stefan Schäfer, Bruhl; Alexander Ohorodnik, Erftstadt-Liblar; Klaus Gehrmann, Erftstadt-Lechenich, and Albert Mainski, Rodenkirchen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 10, 1976, Ser. No. 694,664
Claims priority, application Germany, June 12, 1975, 2526241
Int. Cl.² B01D 3/10, 3/34
U.S. Cl. 203—79 **6 Claims**



1. A process for purifying dilute sulfuric acid contaminated with acetic acid and hydrogen chloride with the resultant formation of concentrated sulfuric acid of about 94–96 % strength and acetic acid, the sulfuric acid to be purified forming part of a mixture consisting substantially of about 30–60 weight % of concentrated sulfuric acid, about 20–50 weight % of acetic acid, about 10–40 weight % of water, and about 2–10 weight % of hydrogen chloride, which process comprises: heating, in a first step, the contaminated sulfuric acid to a temperature of at most about 60° C under a pressure of about 25–30 mm Hg and thereby expelling all of the hydrogen chloride together with minor proportions of acetic acid and water; heating, in a second step, the sulfuric acid to a temperature of at most 165° C under a pressure of about 20–25 mm Hg and

thereby distilling off the bulk of acetic acid together with water with the resultant formation of (a) sulfuric acid containing at most 1.3 up to 1.6 weight % of residual acetic acid and (b) of acetic acid of about 70–80 weight % strength; cooling, in a third step, the sulfuric acid down to a temperature of about 60°–90° C, diluting it with about 10–30 weight % of water with agitation and while cooling is continued, and then heating the sulfuric acid to a temperature of about 160°–165° C under a pressure of about 20–25 mm Hg and thereby freeing it from the water and residual acetic acid.

4,045,296

RATE SENSING BATCH ANALYSIS METHOD AND ENZYME USED THEREIN

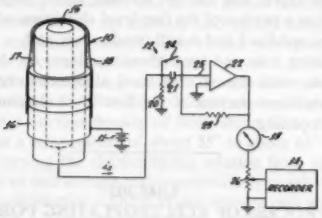
James C. Sternberg, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 279,011, Aug. 9, 1972, Pat. No. 3,933,593, which is a division of Ser. No. 117,632, Feb. 22, 1971, abandoned, which is a division of Ser. No. 618,859, Feb. 27, 1967, Pat. No. 3,857,771. This application Dec. 29, 1975, Ser. No. 645,009

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—103.5 R **1 Claim**



1. A method of determining the cholesterol concentration in a cholesterol containing sample comprising the steps of:

oxidizing the cholesterol present in the sample in an oxygen saturated aqueous solution by means of cholesterol oxidase in the presence of a sensor which serves to monitor a property or characteristic of oxygen in said solution related to the oxygen concentration thereof;

generating a first electrical signal related to said oxygen concentration;

differentiating said first electrical signal to produce an output signal proportional to the instantaneous time rate of change of oxygen concentration; and

measuring said output signal to determine said cholesterol concentration.

4,045,297

TRIGLYCERIDES DETERMINATION METHOD

Lloyd E. Weeks, St. Louis; John H. Johnson, Kirkwood, and Margaret J. Reents, Manchester, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 15, 1975, Ser. No. 640,361

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—103.5 R **7 Claims**

1. The method of determining triglycerides in blood serum or plasma comprising reacting a sample of said blood serum or plasma with a lipolytic enzyme to liberate free glycerol, reacting said free glycerol with an oxygenated aqueous solution containing ATP, GK, α-GPDH, NAD and an electron acceptor and measuring the uptake of oxygen by the oxidation of the resulting NADH with an oxygen sensing electrode.

4,045,298

ANTIBIOTIC XK-62-2 AND PROCESS FOR PRODUCTION THEREOF

Takashi Nara, Tokyo; Seigo Takasawa, Kawasaki; Ryo Okachi, Machida; Isao Kawamoto, Machida; Mitsuyoshi Yamamoto, Machida; Seiji Sato, Machida; Tomoyasu Sato, Machida, and Atsuko Morikawa, Tama, all of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 364,058, May 25, 1973. This application June 15, 1976, Ser. No. 696,306

Claims priority, application Japan, May 27, 1972, 47-52177; Sept. 11, 1972, 47-90477

Int. Cl.[2] C12D *9/14*

U.S. Cl. 195—80 R **12 Claims**

10. A process for the production of the antitiotics gentamicin C_1, gentamicin C_2 and gentamicin C_{1a} which comprises culturing a microorganism belonging to the species *Micromonospora sagamiensis* which is capable of producing said antibiotics in a nutrient medium until substantial antibacterial activity is detected in the culture liquor; and thereafter isolating at least one of said antibiotics therefrom.

4,045,299

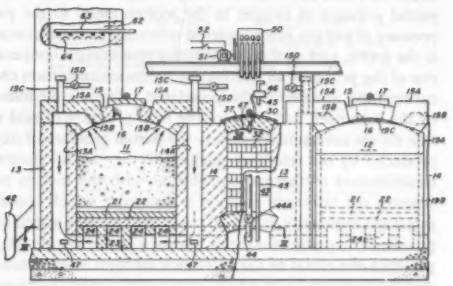
SMOKELESS NON-RECOVERY TYPE COKE OVEN

James E. MacDonald, Latrobe, Pa., assignor to Pennsylvania Coke Technology, Inc., Greensburg, Pa.

Filed Nov. 24, 1975, Ser. No. 634,602

Int. Cl.[2] C10B *9/00*

U.S. Cl. 202—93 **9 Claims**



1. A smokeless and non-recovery type coke oven comprising:

means for forming an oven chamber including side walls, an oven roof carried by the side walls, removable door means for the discharge of coke from the oven chamber, and a floor to support a coal charge introduced into the oven chamber through a closable opening in said roof,

means defining a sole heating flue for conducting partially-burned distillation products beneath said floor in heat-conducting contact therewith,

means for conducting partially-burned distillation products from the space above a coal charge in said oven chamber into said sole heating flue,

means defining a discharge flue arranged to receive the partially-burned distillation products from said sole heating flue,

ignition chamber means including first and second ignition chambers each having checkerbricks therein to incinerate the partially-burned distillation products received from said discharge flue,

means coupled to at least said first ignition chamber to heat the ignition chamber means independently of the heat liberated by incinerating the partially-burned distillation products and only to maintain a predetermined elevated operating temperature within said first and second ignition chambers,

means responsive to the temperature within said ignition chamber means to activate said means to heat the ignition

chamber means only when the detected temperature therein falls below said predetermined elevated operating temperature,

secondary air supply means coupled to said ignition chamber means to insure and facilitate complete incineration of the partially-burned distillation products within the ignition chamber means independently of said means to heat the same,

conduit means extending horizontally to conduct combustion products from said second ignition chamber means, and

a stack to draw combustion products from said conduit means.

4,045,300

METHOD FOR REDUCING THE RESPONSE TIME IN OXYGEN MEASURING PROBES

Claude Renet, Pontchartrain, France, assignor to "Meci" Materiel Electrique de Controle et Industriel, Paris, France

Filed May 1, 1975, Ser. No. 573,720

Claims priority, application France, May 6, 1974, 74.15550

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **14 Claims**

1. A method for reducing the response time in the measurement of the oxygen content in molten metal by means of a probe of the type comprising a solid electrolyte which produces an electromotive force depending on the ratio of the partial pressure of oxygen in the molten metal to the partial pressure of oxygen in a powdered reference medium contained in the probe, said method comprising producing a temperature rise of the probe by an exothermic oxidation-reduction chemical reaction initiated in the powdered reference medium and by the bath itself and whereof the final products of said reaction do not substantially modify the partial pressure of oxygen produced by the reference medium to thereby accelerate the establishment of thermal equilibrium with the molten metal, wherein the reference medium is a powder which contains a metal and optionally its lowest oxide and wherein added to this powder is an oxide of a metal having a lower affinity for oxygen than the metal of the reference medium in an amount so that the final products do not substantially modify the partial pressure of oxygen produced by the reference medium, and wherein the metals used are chosen from the group constituted by: Fe, Cu, Ni, Co, Mo, Cr, these metals being arranged in increasing order of their affinity for oxygen, the metal of the reference medium being chosen from the last four and the oxide being an oxide of any one of the metals preceding the reference metal in the list.

4,045,301

ELECTROLYTIC DEPOSITION OF METALS

Karel Wens; Hubert Tobback, and Karel Hens, all of Olen, Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Sept. 24, 1975, Ser. No. 616,478

Claims priority, application Luxembourg, Oct. 8, 1974, 71072

Int. Cl.[2] C25D *1/20, 1/04*

U.S. Cl. 204—12 **11 Claims**

1. A process for separating an electrolytic deposit of metal from a cathode, in which the bath-level edge of the said electrolytic deposit is locally heated at a plurality of spots so as to form a plurality of spaced apart gaps between the said edge and the cathode, then the plurality of spaced apart gaps are enlarged by means of a plurality of spaced apart knives so as to unite the plurality of spaced apart gaps into a large gap along the said edge, and then a wedge is operated from the said large gap to separate the entire deposit from the cathode.

4,045,302

MULTILEVEL METALLIZATION PROCESS

Stephen R. Gibbs, Escondido, and Kuen Chow, Del Mar, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 8, 1976, Ser. No. 703,412

Int. Cl.[2] C25D *5/02*; H01L *23/48*

U.S. Cl. 204—15 **4 Claims**

1. A method of making a multilevel conductor pattern for a semiconductor device comprising:

depositing a first level aluminum layer on a semiconductor substrate;

anodizing said first level aluminum to form a porous alumina layer on the top surface thereof;

anodizing said first level aluminum layer to form a barrier alumina layer subjacent to the porous alumina layer;

masking desired first level conductor sites with a resist;

etching both of the alumina layers down to the first level aluminum layer except in the conductor site areas protected by the resist;

anodizing the first level aluminum layer to convert it to nonconductive alumina except in the conductor site areas protected by the resist and the remaining barrier alumina layer;

removing the resist;

forming an insulating layer over the first level aluminum layer;

etching an opening through the insulating area, porous alumina layer, and barrier alumina layer, respectively, to expose a portion of the first level aluminum which has not been anodized and is still conductive; and

depositing a second level aluminum layer on the insulating layer, with the second level aluminum contacting the unanodized portion of the first level aluminum through the opening.

4,045,303

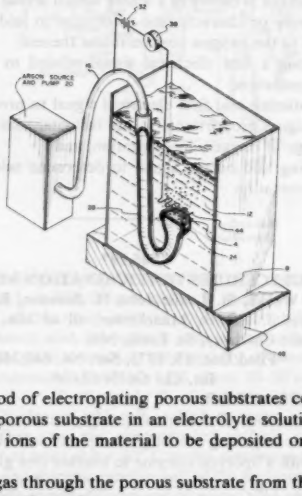
PROCESS OF ELECTROPLATING POROUS SUBSTRATES

Barrie C. Campbell, Orem, Utah, assignor to Billings Energy Corporation, Provo, Utah

Filed Aug. 5, 1976, Ser. No. 711,772

Int. Cl.[2] C25D *7/00, 7/04*

U.S. Cl. 204—24 **11 Claims**



1. A method of electroplating porous substrates comprising

placing a porous substrate in an electrolyte solution which includes ions of the material to be deposited on the substrate,

forcing a gas through the porous substrate from the bottom side upwardly, and

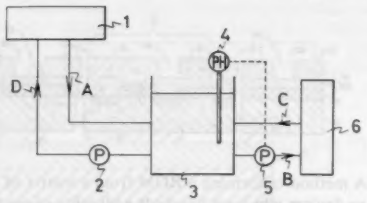
applying an electric current to the substrate and electrode while gas is being forced through the substrate.

4,045,304

HIGH SPEED NICKEL PLATING METHOD USING INSOLUBLE ANODE

Junichi Tezuka, Isehara, Japan, assignor to Electroplating Engineers of Japan, Ltd., Tokyo, Japan

Filed May 5, 1976, Ser. No. 683,250
Int. Cl.[2] C25D 3/12, 21/14, 21/18
U.S. Cl. 204—49 4 Claims



1. A process for the high speed electroplating of nickel, utilizing an electroplating solution consisting essentially of from about 350 to about 400 grams per liter of nickel sulfate and from about 30 to about 50 grams per liter of boric acid, said solution having a pH in the range of from 2.5 to 3.5, which comprises the steps of: continuously pumping a first stream of said electroplating solution from a storage tank to jet nozzle means in a plating container, said nozzle means having insoluble anode means at the tip thereof, said anode means being opposed to and being located close to the workpiece to be plated which is connected as the cathode, and directing jet means of said electroplating solution from said nozzle means against the workpiece whereby to electroplate nickel on said workpiece at a current density of from about 10 to about 70 A/dm^2 and at a temperature of about 55° to about 65° C; continuously returning the electroplating solution from said plating container to said storage tank; continuously monitoring the pH of the electroplating solution in said storage tank and when the pH of said electroplating solution in said storage tank has decreased to a preselected low level, pumping a second stream of the electroplating solution, separate from said first stream, from said storage tank through a vessel containing pieces of nickel metal and thence back to said storage tank whereby to increase the nickel ion content of said electroplating solution present in said storage tank and to increase the pH thereof, and continuing to pump said second stream of electroplating solution from said storage tank through said vessel until the pH of the electroplating solution in said storage tank rises to a preselected high value and then discontinuing pump of said second stream through said vessel, the pH of the electroplating solution in said storage tank being continuously maintained in the range of from 2.5 to 3.5.

4,045,305

CADMIUM ELECTROPLATING BATH AND PROCESS

Jaan-Jiue Fong, Tolland, and Grace F. Hsu, Somers, both of Conn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 14, 1975, Ser. No. 595,276
Int. Cl.[2] C25D 3/26
U.S. Cl. 204—50 R 11 Claims

1. An aqueous electroplating bath for depositing cadmium consisting essentially of about 5 to about 75 grams per liter of cadmium ion, a free acid selected from the group consisting of sulfuric acid, fluoboric acid or mixtures thereof, the concentration of said free acid being from about 0.4N to about 4.0N, from about 0.05 to about 2.0 grams per liter of at least one non-sulfur containing organic brightener compound, and a surfactant combination comprising about 0.5 to about 10.0 grams per liter of a condensed naphthalene sulfonic acid or salt thereof and from about 1.0 to about 20.0 grams per liter of a non-ionic polyoxyalkylated compound.

4,045,306

ELECTROPLATING ZINC AND BATH THEREFOR

Gerd Senge, and Günter Voss, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Filed June 1, 1976, Ser. No. 691,625
Claims priority, application Germany, June 4, 1975, 2525264
Int. Cl.[2] C25D 3/22, 3/24
U.S. Cl. 204—55 R 6 Claims

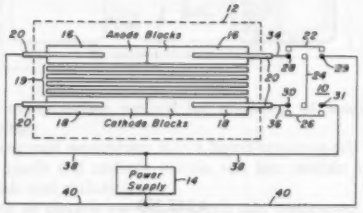
1. An aqueous alkaline substantially cyanide-free bath for the electrodeposition of zinc, comprising a zinc salt, an alkali hydroxide, and an effective amount of a brightener which is a reaction product of from 1 to 4 moles of a halohydrin selected from the group consisting of an epihalogen hydrin and a glycerol halogen hydrin with from 1 to 2 moles of a heterocyclic compound selected from the group consisting of pyrazol, 1,2,3-triazol, tetrazol, pyridazine, pyrimidine, pyrazine, 1,3,5-triazine, tetrazine, purine, quinoxaline, pteridine, 1,23-oxadiazol, 3-amino-1,2,4-triazol, 1,3,4-thiadazol, 1,2,4-thiadiazine, benzothiadiazine, and 1,2,4-triazol.

4,045,307

STRUCTURE FOR SWITCHING ELECTRICAL CURRENT AND CELL COMPRISING SAME

Bernard C. Turley, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 14, 1976, Ser. No. 648,903
Int. Cl.[2] C25C 3/00
U.S. Cl. 204—64 5 Claims



1. Structure for changing the path of current flow through an electrical load connected to a source of electrical current by four fixed conductors physically disposed in close but spaced relationship to each other, two of the four conductors being hereinafter referred to as source conductors and two as load conductors, a movable, electrically conductive switch member located on one side of one source and one load conductor for electrically connecting the one load conductor and the one source conductor together, a second movable electrically conductive switch member located on one side of the other two load and source conductors for electrically connecting the same together, two electrically insulative members for physical disposal in location between the load conductors and, two electrically conductive members for physical disposal in respective locations between the switc members and their associated load conductors, the electrically conductive members being effective to respectively electrically connect together the switch members and their associated load conductors when the switch members are moved to engage the source conductors and the conductive members.

4,045,308

BATH LEVEL SET POINT CONTROL IN AN ELECTROLYTIC CELL AND METHOD OF OPERATING SAME

Russell L. White, Vienna, W. Va., and Kenneth L. Edwards, Louisville, Tenn., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 4, 1976, Ser. No. 738,657
Int. Cl.[2] C25C 3/06
U.S. Cl. 204—67 6 Claims

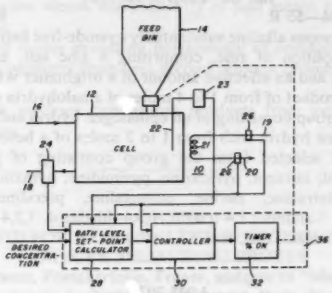
1. A method of operating an electrolytic cell for the produc-

tion of aluminum by reduction of an aluminum halide in a molten salt bath, the method comprising the steps of

measuring the height of the molten salt in the cell,

measuring the density of the molten salt,

measuring the volume of the molten metal in the cell, and



adding an amount of aluminum halide to the cell sufficient to prevent deleterious reduction of molten metal salts in the bath, said amount being determined by said measurements of salt level height, salt density and metal volume in the cell.

4,045,309

METHOD FOR MEASURING AND CONTROL OF THE ENERGY IN ALUMINUM REDUCTION CELLS

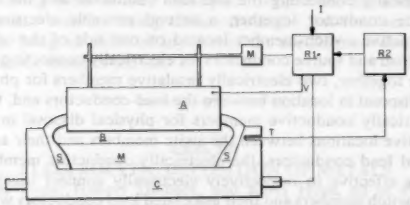
Jens Arvid Andersen, Kolbotn, Norway, assignor to Norsk Hydro a.s, Oslo, Norway

Filed Apr. 9, 1976, Ser. No. 675,568

Claims priority, application Norway, Apr. 10, 1975, 751256

Int. Cl.[2] C25C *3/06*; C25D *17/00*

U.S. Cl. 204—67 **4 Claims**



1. A method for measuring and controlling the energy balance in an aluminum reduction cell of the type wherein anodes are immersed in an electrolyte within a cathode lining, and wherein during operation of the cell, crust is formed on the inner surface of the lining, said method comprising:

measuring the temperature of a side of said lining by means of at least one thermoelement located in said lining;

comparing the thus measured temperature with a reference temperature; and

adjusting the immersion level of said anodes within said electrolyte when the difference between said measured temperature and said reference temperature exceeds a given value.

4,045,310

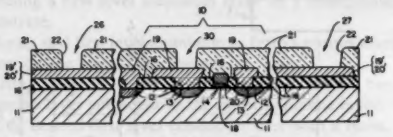
STARTING PRODUCT FOR THE PRODUCTION OF A READ-ONLY MEMORY AND A METHOD OF PRODUCING IT AND THE READ-ONLY MEMORY

Robert K. Jones, Centerville, Ohio, and Harry Sue, Chicago, Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed May 3, 1976, Ser. No. 682,411

Int. Cl.[2] C25F *3/00, 3/14*

U.S. Cl. 204—129.4 **18 Claims**



1. A method of forming a ROM from a matrix of semiconductive devices which each include a plurality of electrodes, at least one of which electrodes in each device includes a metallic conductor in contact with a doped semiconductor region, wherein the method comprises:

rapidly decreasing the cross-sectional area of selected ones of the conductors in contact with doped regions with an etchant which forms, with the conductor and the doped region, an electrochemcial cell; conductors not in contact with the doped regions etching at a slower, chemical rate; and then

passing sufficient current through selected conductors to fuse the decreased cross-sectional area thereof.

4,045,311

PROCESS FOR MAKING A MINUTE HOLE

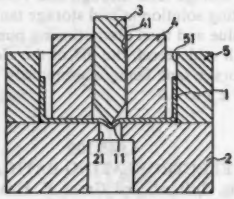
Masao Matsui, Nagoya; Atsunobu Murata, Aichi; Masami Isii, and Hiromu Komai, both of Toyota, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Sept. 28, 1976, Ser. No. 727,695

Claims priority, application Japan, Sept. 30, 1975, 50-118675

Int. Cl.[2] C25F *3/02, 3/04, 3/06*

U.S. Cl. 204—129.55 **8 Claims**



1. A process for making a minute hole in the wall of a metal article, comprising the steps of:

forming a depression in the wall of a metal article at a localized spot on one of the surfaces of said wall, said depression having a depth exceeding the thickness of said wall and having a projection with an apex extending from the other surface of said wall;

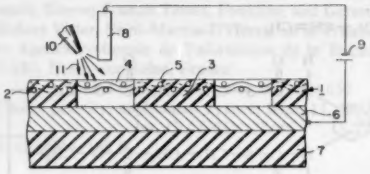
positioning said apex of said projection formed on said other surface of said wall in an opposed spaced relationship to a cathode within an electrolyte; and

introducing an electric current between said projection, which serves as an anode, and said cathode until said apex of said projection is dissolved to form a minute hole in said wall.

4,045,312
METHOD FOR THE ELECTROLYTIC ETCHING OF METAL WORKPIECE

Takeuchi Satoshi, Kawasaki, Japan, assignor to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,324
Claims priority, application Japan, Nov. 30, 1974, 49-138617
Int. Cl.[2] C25F 3/14, 3/00
U.S. Cl. 204—129.65 16 Claims

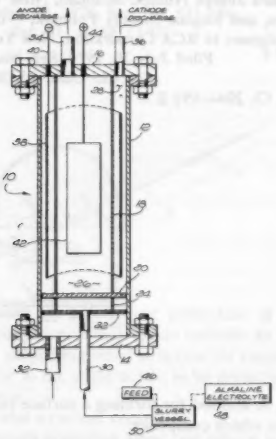


1. A method for the electrolytic etching of a metal workpiece comprising placing a stencil made of an electric insulating material containing a pattern having open portions and closed portions into intimate contact with the metal workpiece, placing an electrode adjacent to said metal workpiece, maintaining a distance of from several 10 microns to several mm between said electrodes and said metal workpiece, and jetting an electrolyte between said electrode and said metal workpiece while passing an electric current through the jet of electrolyte in the direction from said metal workpiece to said electrode to electrolytically etch said metal workpiece, and then separating said stencil from the electrolytically etched metal workpiece.

4,045,313
ELECTROLYTIC RECOVERY FROM BITUMINOUS MATERIALS

Teh Fu Yen, Altadena, and Chaur-Shyong Wen, Los Angeles, both of Calif., assignors to The University of Southern California, Los Angeles, Calif.

Filed Aug. 23, 1976, Ser. No. 716,859
Int. Cl.[2] C25B 3/02
U.S. Cl. 204—131 10 Claims

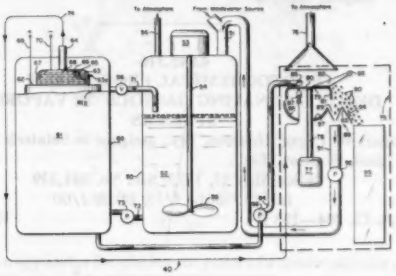


1. A process for treating bituminous material for recovery of chemicals therefrom, comprising:
slurrying said material with an aqueous alkaline electrolytic solution;
defining an electrolytic cell having a cathode chamber electrolytically operative with an anode chamber, an anode in said anode chamber in contact with said slurry and a cathode in said cathode chamber; and
applying a direct current potential across said anode and cathode chambers at a current density of above about 15 A/m^2 for a time sufficient to effect substantial oxidative electrolysis of said material whereby to obtain a water-soluble product, and a residue, therefrom; and
separating said water-soluble product from said residue.

4,045,314
WASTE EVAPORATION DISPOSAL SYSTEM

Robert L. Rod, Marina Del Rey; Walter L. Penick, Jr., Culver City, and Henry B. Heller, Pasadena, all of Calif., assignors to Monogram Industries, Inc., Santa Monica, Calif.

Filed May 29, 1975, Ser. No. 581,851
Int. Cl.[2] C02C 5/12, 3/00
U.S. Cl. 204—151 12 Claims



1. A non-polluting method for disposing of waste-water comprising:
bringing said wastewater into a liquid-retaining cell having an anode and cathode therein and into contact with an anode and cathode.
passing an electric current through said wastewater in said cell and between said anode and cathode thereby producing hydrogen gas at the cathode and a halogen at said anode;
keeping the hydrogen gas separate from the chlorine gas;
bringing said halogen into intimate contact with said wastewater in said cell to disinfect and said wastewater;
collecting said hydrogen gas;
removing said wastewater after contact with said halogen from said cell; and
evaporating said wastewater using said collected hydrogen gas as a source of fuel to convert the removed wastewater from said cell into disinfected non-polluting sterile solid residue and water vapor.

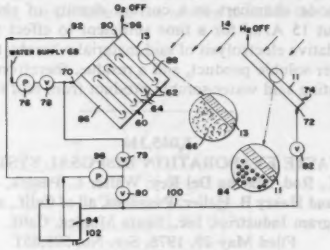
4,045,315
SOLAR PHOTOLYSIS OF WATER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Porter R. Ryason, La Canada, Calif.

Filed Feb. 13, 1976, Ser. No. 658,132
Int. Cl.[2] B01J 1/10; B01K 1/00
U.S. Cl. 204—157.1 R 26 Claims

1. A method of photolyzing water comprising the steps of:
applying solar radiation to a first vessel containing an aqueous solution of a water soluble photo-oxidizable reagent and generating hydrogen gas therefrom while forming a spent solution containing oxidized, spent reagent;
applying solar radiation to a second vessel containing water and a water insoluble photoreducible reagent catalyst and generating oxygen gas therefrom while forming spent, reduced photoreducible reagent catalyst;
combining the spent solution containing oxidized photo-oxidizable reagent with the spent reduced photo-reducible

reagent catalyst and regenerating said reagents in the dark to form a solution of regenerated photo-oxidizable reagent



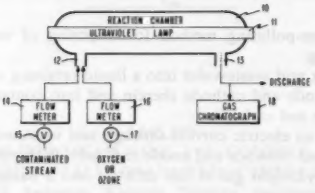
containing water-insoluble, regenerated photo-reducible reagent catalyst.

4,045,316

PHOTOCHEMICAL PROCESS FOR DECONTAMINATING GASEOUS OR VAPOROUS STREAMS

Robert W. Legan, Houston, Tex., assignor to Shintech Incorporated, Houston, Tex.

Filed May 27, 1975, Ser. No. 581,239
Int. Cl.[2] B01J *1/10*; B01K *1/00*
U.S. Cl. 204—158 R **13 Claims**



1. A process for photochemically treating a gaseous or vaporous stream containing an oxidizable contaminant, said process comprising exposing said contaminant to ultraviolet radiation from a source of radiation emitting ultraviolet wavelengths shorter than 2100 A in the presence of ozone thereby oxidizing said contaminant to form simple, gaseous products, said ozone being in addition to any ozone formed by said source of ultraviolet radiation.

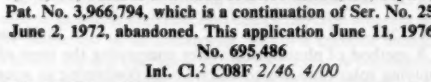
4,045,317

CURABLE POLYENE-POLYTHIOL COMPOUNDS AND METHODS FOR PREPARATION AND CURING

Donald W. Larsen, Marriottsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 558,041, March 13, 1975, Pat. No. 3,976,553, which is a division of Ser. No. 504,410, Sept. 9, 1974, Pat. No. 3,966,794, which is a continuation of Ser. No. 259,148, June 2, 1972, abandoned. This application June 11, 1976, Ser. No. 695,486
Int. Cl.[2] C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **4 Claims**

1. A method for forming a solid article comprising exposing a compound having the formula



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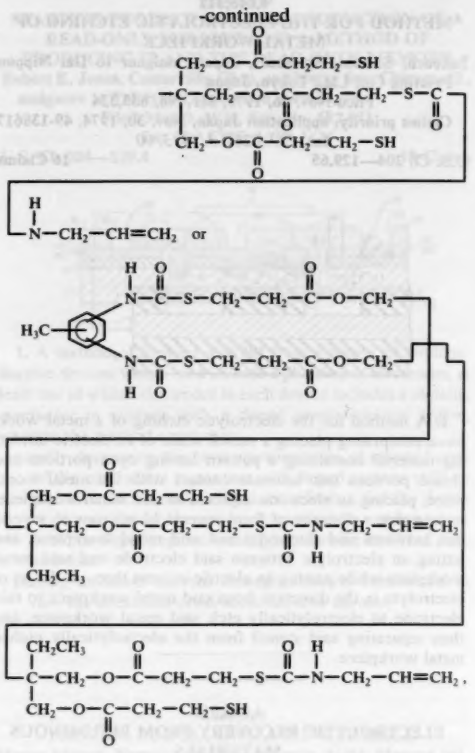
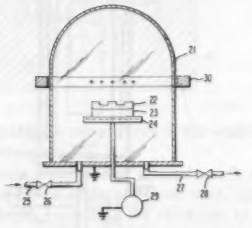


4,045,318

METHOD OF TRANSFERRING A SURFACE RELIEF PATTERN FROM A POLY(OLEFIN SULFONE) LAYER TO A METAL LAYER

Richard Joseph Himics, Skillman; Nitin Vithalbhai Desai, Edison, and Eugene Samuel Poliniak, Willingboro, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 30, 1976, Ser. No. 710,184
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 E **7 Claims**



7. A method for forming a surface relief pattern in a metal layer which comprises:

a. exposing a poly(olefin sulfone) layer in contact with the metal layer to a modulated beam of electrons;

b. developing the exposed poly(olefin sulfone) layer to form a surface relief pattern therein;

c. exposing the developed poly(olefin sulfone) layer to ultra violet radiation; and

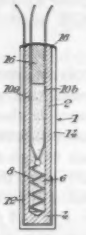
d. bombarding the irradiated surface with sufficient ions to substantially remove the poly(olefin sulfone) layer and etch the surface relief pattern into the metal layer.

4,045,319

ELECTROCHEMICAL GAGE FOR MEASURING PARTIAL PRESSURES OF OXYGEN

Charles Henri Deportes, Brignoud; Marc Patrice Sylvain Henault, Gieres; Francis Tasset, Fontaine, and Gerard Raymond Robert Vitter, Saint-Martin-D'Heres, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neilly-sur-Seine, France

Filed Sept. 9, 1974, Ser. No. 504,630
Claims priority, application France, Sept. 11, 1973, 73.32671
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S 23 Claims



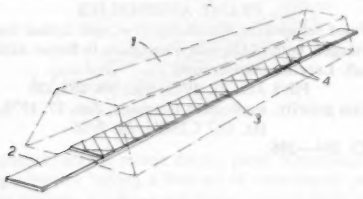
1. In an electrochemical gage for measuring partial pressures of oxygen, said gage comprising a solid electrolyte and an internal reference, the improvement whereby the internal reference consists essentially of a palladium:palladium oxide redox couple.

4,045,320

GALVANIC ANODE

Øystein F. Klingenberg, Aby I Bamble, Norway, assignor to A. S. Skarpenord, Langesund, Norway

Filed May 28, 1976, Ser. No. 691,146
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—197 8 Claims



1. In an anode used for electrolytic protection of metal construction from corrosion, which anode includes an anode material cast onto a supporting metal structure for suspending or securing the anode to the construction to be protected, the improvement wherein:

said supporting metal structure comprises;

main support means extending along one side of and beyond said anode material, and

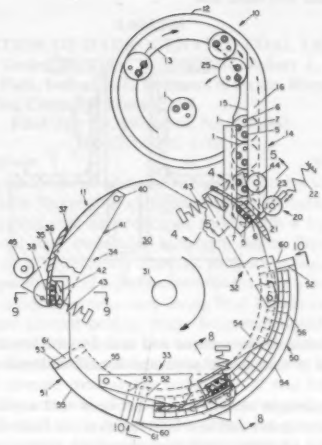
an expansible network of metal bonded to at least a portion of said one side of said anode material, and operable to hold said main support means in position while expanding and contracting with said anode material.

4,045,321

METHOD AND APPARATUS FOR PLATING THE POSTS OF A SEMICONDUCTOR CHIP HEADER

Carl E. Bernardi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 17, 1975, Ser. No. 623,323
Int. Cl.[2] C25D *17/28, 17/22, 5/02*
U.S. Cl. 204—202 8 Claims



1. An apparatus for plating the posts of a semiconductor chip header having at least one envelope lead electrically connected to a metallic envelope enclosing said header and a predetermined number of thru-leads which are insulated from and pass through said envelope for forming posts on the top thereof comprising:

means for feeding a plurality of said headers in single file to a predetermined position in said apparatus, said means for feeding including means for providing a predetermined orientation of said thru-leads at said predetermined position;

means for transporting said headers from said predetermined position over the surface of a plating bath for immersing said posts in said bath;

means for separating and electrically insulating said thru-leads from said envelope lead including means associated with said transporting means for clamping and holding said header; and

means for coupling a source of potential between said thru-leads and said bath while said posts are immersed in said bath for selectively plating said posts.

4,045,322

CONNECTION MEANS FOR ANODE POSTS IN DIAPHRAGM CELLS

Philip R. Bridendall, Jr., Wilton, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 29, 1976, Ser. No. 671,303
Int. Cl.[2] C25B *1/26, 9/02*
U.S. Cl. 204—263 8 Claims

1. In an electrolytic cell comprised of a cell base having:

a. an interior layer which provides an interior surface,

b. a conducting layer which provides an exterior surface,

c. a cell body secured to said cell base,

1. a plurality of diaphragm-coated cathodes secured to said cell body,

d. a plurality of anodes, each anode comprising:

1. a metallic conductive surface secured to

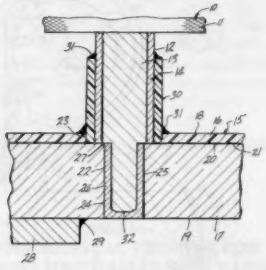
2. an anode post, said anode post being secured to said cell base,

3. each metallic conductive surface being positioned adjacent to and parallel to at least one of said cathodes,

e. and current conducting means secured to said exterior surface,

characterized by the improvement which comprises in combination,

f. soldered connections between each of said anode posts and said cell base in said separate opening for each anode post in said cell base, and



g. a plastic sleeve secured and sealed to the lower portion of each of said anode posts above said soldered connection, and

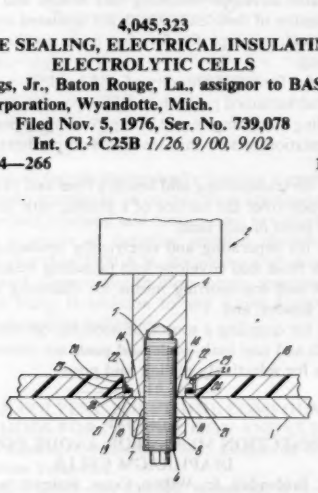
h. liquid-tight sealing means between said anode post, said plastic sleeve and said interior layer for each of said anode posts, whereby inhibition of crevice corrosion and electrolytic attack upon said anode post is obtained.

4,045,323

ANOLYTE SEALING, ELECTRICAL INSULATING FOR ELECTROLYTIC CELLS

Frank Boggs, Jr., Baton Rouge, La., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 5, 1976, Ser. No. 739,078
Int. Cl.² C25B *1/26, 9/00, 9/02*
U.S. Cl. 204—266 **10 Claims**



1. In a diaphragm-type electrolytic cell for the production of chlorine and caustic from alkali metal chloride solutions, the improvement comprising:

a. a cell base, having at least one opening defined therein,

b. a semi-rigid electrically non-conductive blanket covering said cell base having at least one opening defined therein corresponding to said opening in said cell base, said blanket having an integral lip disposed around said opening,

c. at least one metal anode having a collar near one end thereof corresponding to said lip, said end being affixed to said cell base passing through said blanket opening, and

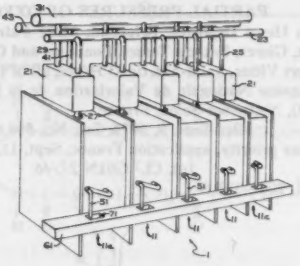
d. a resilient gasket disposed around said anode and interposed between the lip of said blanket and said collar.

4,045,324

CELL LIQUOR EMISSION CONTROL

Hugh Cunningham, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 11, 1976, Ser. No. 713,451
Int. Cl.² C25B *1/26, 9/00*
U.S. Cl. 204—268 **4 Claims**



1. In a bipolar electrolyzer having a plurality of individual electrolytic cells electrically and mechanically in series, each of said cells having an anolyte chamber and a catholyte chamber and catholyte liquor withdrawal means, said electrolyzer having a catholyte liquor trough disposed beneath said catholyte liquor withdrawal means, the improvement comprising means for limiting emission of catholyte liquor laden moisture from said cell liquor trough and for indicating low catholyte cell liquor level in an individual electrolytic cell of said electrolyzer, which emmision limiting and low liquor level indicating means comprises:

a top on said cell liquor trough, said top having recesses therein corresponding to said catholyte liquor withdrawal means;

said recesses having first apertures therein communicating with the cell liquor trough and at the intended level of cell liquor in the recess; and

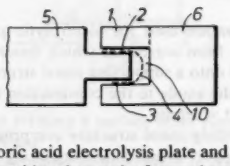
said recess having second apertures therein communicating with the cell liquor trough below the first apertures.

4,045,325

MEMBRANE SEAL FOR ELECTROLYSIS PLATE AND FRAME ASSEMBLIES

Karl-Josef Schwickart, Siershahn, Ww., and Lothar Sesterhenn, Dormagen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 21, 1976, Ser. No. 651,330
Claims priority, application Germany, Jan. 27, 1975, 2503215
Int. Cl.² C25B *1/24, 9/00*
U.S. Cl. 204—286 **6 Claims**



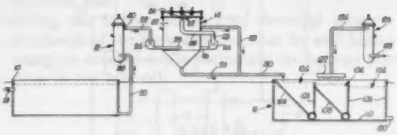
1. In a hydrochloric acid electrolysis plate and frame assembly comprising a graphite plate and a frame about said plate so as to provide a gas tight seal while maintaining a sliding fit, the improvement which comprises a tension-free membrane seal fastened to the frame and to the plate across the the space where sliding movement therebetween can occur.

4,045,326

SUSPENDED SOLIDS EXTRACTION SYSTEM AND METHOD

Arthur Shelley King, 8021 Cherokee Lane, Leawood, Kans. 66206

Filed Aug. 10, 1976, Ser. No. 713,251
Int. Cl.[2] B03C 5/00; C02C 5/12
U.S. Cl. 204—299 R 14 Claims



1. In a device for treating fluids by exposing the same to an electric field:

an outer, hollow, cylindrical electrode defining an interior treating region for fluid flow therethrough;

an inner, cylindrical, coaxially disposed electrode within said region;

a plurality of intermediate, cylindrical, field concentrating electrodes within said region and arranged in a circular pattern about said inner electrode in concentric relationship therewith; and

means electrically connecting said electrodes across a source of electrical potential,

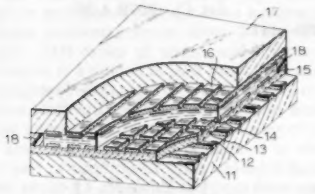
said inner and outer electrodes being connected to the same side of said source for similar charging thereof, and said intermediate electrodes all being connected to the opposite side of said source for charging thereof oppositely of said inner and outer electrodes.

4,045,327

ELECTROPHORETIC MATRIX PANEL

Shinichi Noma, Katano, and Nobumasa Ohshima, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 26, 1975, Ser. No. 607,902
Claims priority, application Japan, Aug. 28, 1974, 49-99344; Aug. 29, 1974, 49-99665
Int. Cl.[2] C25D 1/12; G03G 13/00
U.S. Cl. 204—299 R 4 Claims



1. An electrophoretic matrix display panel comprising a first insulating substrate having a first set of strip-shaped parallel electrodes thereon, a voltage non-linear resistive layer on said first set of parallel electrodes, said non-linear resistive layer being SiC particles having an average grain size smaller than 5μ in urea resin, said SiC particles and urea resin being mixed in a weight ratio of from 2:3 to 2:10, dot-shaped intermediate electrodes isolated from each other and positioned on said voltage non-linear resistive layer, an electrophoretic suspension layer consisting of suspending medium and at least one electrophoretic material suspended in said suspending medium, a frame around the periphery of said panel, and a second insulating substrate having a second set of strip-shaped parallel electrodes thereon; at least said second insulating substrate and said second insulating substrate being attached to said first insulating substrate through said frame and said second set of parallel electrodes extending in a direction transverse to the direction of said first set of parallel electrodes and crossing said first set of parallel electrodes to define cross points between the respective elements of the sets of electrodes the cross points between said first and second sets of parallel electrodes constituting picture elements of said matrix display panel, said dot-shaped intermediate electrodes being positioned at the cross points between said first and second sets of parallel electrodes.

4,045,328

PRODUCTION OF HYDROGENATED COAL LIQUIDS

Robert C. Green, Berkeley Heights, and Robert L. Dubell, Florham Park, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 23, 1976, Ser. No. 707,963
Int. Cl.[2] C10G 1/06
U.S. Cl. 208—8 10 Claims

1. A process for the production of liquid hydrocarbons from coal or similar liquefiable carbonaceous solids which comprises contacting said carbonaceous solids with a hydrogen-donor solvent and molecular hydrogen under liquefaction conditions in a liquefaction zone to produce a liquefaction effluent; separating said liquefaction effluent into a hot vapor stream and a liquid stream; recovering coal liquids in the hydrogen-donor solvent boiling range from said liquid stream; combining a portion of said hot vapor stream with makeup hydrogen and with said coal liquids to form a solvent hydrogenation feed stream; treating the remainder of said hot vapor stream for the removal of liquid hydrocarbons and contaminants and thereafter discharging the remaining gas as purge; passing said solvent hydrogenation feed stream to a catalytic solvent hydrogenation zone maintained under solvent hydrogenation conditions; recovering a hydrogenated effluent from said solvent hydrogenation zone; separating said hydrogenated effluent into a vaporous fraction containing molecular hydrogen and a liquids fraction; recycling at least a portion of said vaporous fraction including molecular hydrogen and at least a portion of said liquidsfraction to said liquefaction zone; and recycling fluid separated from said hydrogenated effluent to said solvent hydrogenation zone as a quench.

4,045,329

COAL HYDROGENATION WITH SELECTIVE RECYCLE OF LIQUID TO REACTOR

Edwin S. Johanson, Princeton, N.J., and Ronald H. Wolk, San Jose, Calif., assignors to Hydrocarbon Research, Inc., Trenton, N.J.

Continuation-in-part of Ser. No. 434,952, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 137,223, April 26, 1971, abandoned. This application Nov. 28, 1975, Ser. No. 635,796
Int. Cl.[2] C10G 1/08
U.S. Cl. 208—10 6 Claims

1. A process for producing naphtha and light hydrocarbons distillate of a boiling range of about 400° to 800° F from solid carbonaceous substances selected from the class of coal, and lignite in a particulate form, which comprises:

a. slurrying the solid carbonaceous substances with at least a portion of a heavy hydrocarbon slurry-oil recycle liquid produced in the process:

b. feeding the slurry and a hydrogen-rich gas to a reaction zone containing particulate contact solids;

c. passing the slurry and gas upwardly through the reaction zone under liquid phase conditions in which the solids are placed in random motion in the liquid, with the velocity maintained below a rate which carries any substantial portion of the contact solids out of the reaction zone, and under hydrogenation reaction conditions of hydrogen partial pressure between 1500 and 3000 psig and temperature between about 750° and 900° F;

d. removing a gaseous effluent from the reaction zone;

e. removing a liquid effluent from the reaction zone;

f. fractionating out of said liquid effluent fractions comprising at least a light distillate liquid normally boiling between about 450° and 600° F, and a bottoms fraction normally boiling in the range of about 800° to 1000° F;
g. recycling to the reaction zone said bottoms fraction and at least a portion of the 450°-600° F liquid fraction, without recycling to the reaction zone any liquid fraction boiling between about 600° and 800° F; and
h. recovering from said fractionation step (f) a principal product fraction having a normal boiling range of about 400°-800° F.

4,045,330

PROCESS FOR REGENERATING LUBRICATING OILS

René Avrillon, Maisons Laffitte, and Daniel Defives, Paris, both of France, assignros to Institut Francais du Petrole, Rueil-Maimaison, France

Filed June 4, 1976, Ser. No. 692,861
Claims priority, application France, June 4, 1975, 75.17662
Int. Cl.² C10M *11/00*
U.S. Cl. 208—180 **16 Claims**

1. A process for regenerating a used lubricating oil, comprising contacting the oil with particles of a solid adsorption resin comprising at least 0.1 cc per gram of pores of a diameter in the range from 6 to 300 angstroms, said resin being a porous polycondensate or cross-linked copolymer comprising (a) hydroxy groups linked directly or through a $-CH_2-$ or

$$-\overset{|}{C}H-$$

group
to a benzene ring, or (b) pyridyl groups, said contacting being conducted at a temperature wherein the resin is stable.

4,045,331

DEMETALLIZATION AND DESULFURIZATION OF PETROLEUM FEED-STOCKS WITH MANGANESE ON ALUMINA CATALYSTS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 23, 1975, Ser. No. 624,788
Int. Cl.² C10G *23/02*; B01J *23/34*
U.S. Cl. 208—213 **16 Claims**

1. In a process for the demetallization and desulfurization of a liquid hydrocarbon feedstock wherein said feedstock is contacted with a demetallization and desulfurization catalyst at a hydrogen partial pressure between about 100 and 3000 psia and at a temperature between about 600° and 850° F and at a space velocity between about 0.1 and 10.0 L.H.S.V. to obtain therefrom a substantially demetallized product oil, the improvement which comprises utilizing as said demetallization catalyst a composition comprising one or more active manganese components composited with alumina, said catalyst composition having at least 60% of its total pore volume distributed in pores having diameters between about 50 and 200 A, having a surface area in excess of 250 m^2/gm, and containing between about 0.1 and 30 wt.% (calculated as manganese) of said one or more manganese components.

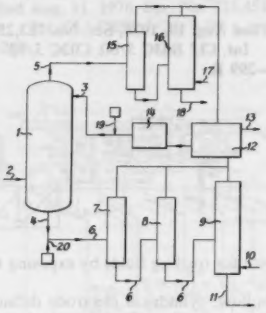
4,045,332

SOLVENT EXTRACTION

Eric Simon Forbes, Lightwater, and Angus Joseph Dickson Reid, Wokingham, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Apr. 27, 1976, Ser. No. 680,695
Claims priority, application United Kingdom, May 14, 1975, 20319/75
Int. Cl.² C01G *21/16*
U.S. Cl. 208—323 **7 Claims**

1. A composition suitable for the solvent extraction of aromatic hydrocarbons from hydrocarbon mixtures containing them comprising furfural and from 0.001 to 5% wt. by weight of furfural, of a furfural soluble recoverable amine selected



from the group consisting of N,N-dialkyl anilines, in which the alkyl groups have from 1 to 5 carbon atoms.

4,045,333

AROMATIC PURIFICATION PROCESS

Allen E. Somers, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 29, 1976, Ser. No. 653,283
Int. Cl.² C10G *19/00, 21/16*
U.S. Cl. 208—327 **4 Claims**

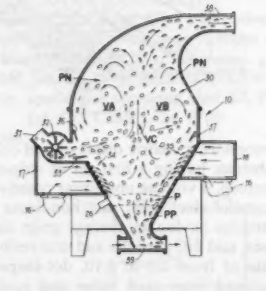
1. A process which comprises passing an aromatic feed containing greater than 50 ppm furfural through a solid bed of particles of a treating agent selected from the group consisting of sodium hydroxide and potassium hydroxide, and recovering therefrom an aromatic product containing less than 25 ppm furfural.

4,045,334

METHOD AND APPARATUS FOR SEPARATING LIGHTER AND HEAVIER PORTIONS OF THRESHED TOBACCO

Ferdinand F. Ferrary, Richmond, Va.; Herman T. Johnson, Pittsboro, N.C., and John H. Hudson, Richmond, Va., assignors to AMF Incorporated, White Plains, N.Y.

Filed May 28, 1976, Ser. No. 691,260
Int. Cl.² B07B *4/00*
U.S. Cl. 209—141 **20 Claims**



1. A method of separating lighter and heavier portions of threshed tobacco comprising the steps of:
providing a separator chamber having a discharge at its top for such lighter portions and a take-off at its bottom for such heavier portions;
providing air inlets in opposite sides of the separator chamber and providing flows of inlet air therethrough;
controlling the quantity and vertical deflection of each of

the inlet air flows thereby creating two vortices adjacent to one another in the separator chamber each in a circulatory path in a direction opposite to the direction of the other of the vortices with the adjacent portions of said vortices coacting to provide a high velocity rising air column to the discharge of the separator chamber;

providing a flow of threshed tobacco into the lower portions of both vortices in the separator chamber;

separating the threshed tobacco by the turbulence of said vortices; and

carrying the lighter portions of threshed tobacco to the discharge of the separator chamber by said high velocity rising air column while permitting the heavier portions to drop to the take-off.

4,045,335

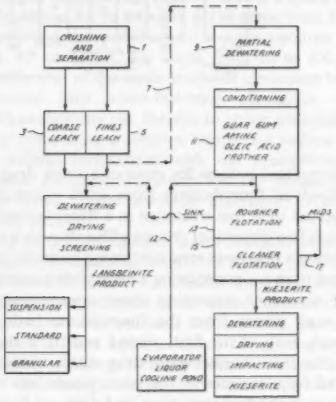
BENEFICIATION OF KIESERITE AND LANGBEINITE FROM A LANGBEINITE ORE

Ben E. Adams, Hanford, Calif., and Edward J. Gidak, Jr., Carlsbad, N. Mex., assignors to Duval Corporation, Houston, Tex.

Filed Mar. 10, 1976, Ser. No. 665,419

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **17 Claims**



1. A process for beneficiating langbeinite from an ore containing langbeinite and kieserite which comprises subjecting to froth flotation particles of said ore in an aqueous magnesium chloride brine containing above about 20 moles magnesium chloride per 1,000 moles of water, said brine containing a flotation reagent in a ratio of at least about 0.5 parts by weight flotation reagent to 2000 parts by weight of said ore particles, said flotation reagent comprising a fatty acid amine, and an organic acid selected from the group consisting of sebacic acid and oleic acid in a weight ratio of about 2 to about 4 parts amine to 1 part of said organic acid, said brine further having a pH below about 3.5, removing the froth from said flotation, and recovering concentrated langbeinite from the sink product of said flotation.

4,045,336

METHOD AND DEVICE FOR OXYGENATING WATER WITH VIBRATIONS AND UNDER PRESSURE STROKES

Pauli Henrik Isteri, Siilitie 9 S 223 00800, Helsinki 80, Finland

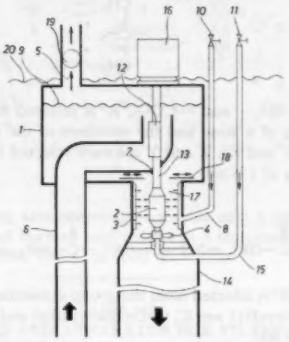
Filed Sept. 19, 1975, Ser. No. 614,876

Claims priority, application Finland, Sept. 27, 1974, 742479; Aug. 8, 1975, 752256

Int. Cl.[2] C02C *1/02, 5/02, 5/10;* **C02B** *1/78*

U.S. Cl. 210—15 **16 Claims**

1. A method for increasing the oxygen content of water for sanitizing natural waters and for purifying water, in which method oxygen or oxygen containing gas is fed into water liberated from gases dissolved therein, characterized in that gases are separated by pressure strokes on the liquid and vibration whereafter oxygen or oxygen containing gas, is fed into the liquid, and water flowing along the suction pipe is set to vibrate by means of a vibrator; said water being discharged and noxious gases escaping from the water; said water being forced by means of a propeller pump and the resultant pressure developed in said water into a gas feed zone provided by dispersion means, said zone being connected to a source of gas through pipes, gas bubbles formed on wet surfaces of the dispersion means for dispersing said bubbles said bubbles being mixed with flowing water, said propeller pump forcing said water with gas bubbles into a discharge pipe and therealong to the desired depth.



4,045,337

ASYMMETRIC, SEMIPERMEABLE MEMBRANES OF CYCLIC POLYUREAS

Birger Knickel, Meerbusch; Hans Rudolph, Krefeld; Jürgen Hocker, Schildgen; Jürgen Lewalter, Cologne, and Hans Jürgen Rosenkranz, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

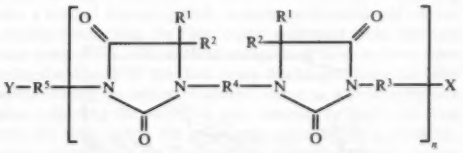
Filed June 24, 1975, Ser. No. 589,950

Claims priority, application Germany, June 28, 1974, 2431071

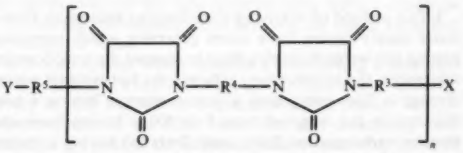
Int. Cl.[2] B01D *13/00;* **C08G** *22/02*

U.S. Cl. 210—23 H **9 Claims**

1. An asymmetric semipermeable membrane of a cyclic polyurea selected from the group consisting of a polyhydantoin of the formula



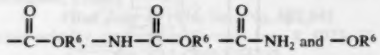
and a polyparabanate of the formula



wherein R^1 and R^2, when taken separately, are each selected from the group consisting of hydrogen, C_1 to C_6 alkyl and C_3 to C_6 cycloalkyl; R^1 and R^2, when taken together with the carbon atom to which they are attached, are cycloalkyl having 5 to 10

carbon atoms; R^3 and R^4 are each selected from the group consisting of C_1 to C_{12} alkylene, C_3 to C_6 cycloalkylene, arylene and any two of the aforesaid members defining R^3 and R^4 connected together by a member selected from the group consisting of —O—, —CH_2—,

—S—, —SO_2— and —CO—; R^5 is selected from the group consisting of a bond and the members of the group defining each of R^3 and R^4; X and Y are each selected from the group consisting of a bond,



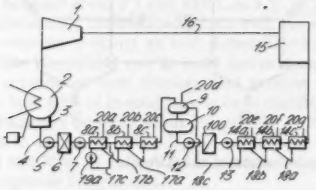
wherein R^6 is selected from the group consisting of aryl, C_1 to C_{12} hydroxyalkyl and C_1 to C_{12} alkoxyalkyl and n is an integer from 2 to 200.

4,045,338

METHOD OF REMOVING SCALE-FORMING SUBSTANCES FROM HOT WATER SYSTEM

Haruo Miyamoto; Tokuhisa Miyamatsu, both of Nagoya; Seiichi Shirakawa, and Hidetoshi Takamoku, both of Nagasaki, all of Japan, assignors to Mitsubishi Rayon Co., Ltd. and Mitsubishi Heavy Industries, Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 474,148, May 28, 1974, abandoned. This application June 30, 1976, Ser. No. 701,732
Claims priority, application Japan, May 29, 1973, 48-59365
Int. Cl.² B01D *15/04*
U.S. Cl. 210—36 **9 Claims**



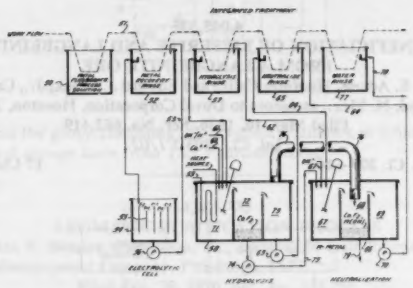
1. In a method of removing scale-forming substances from a water supply system for a steam generator which comprises passing hot water through a filter to remove the scale-forming substances, the improvement wherein the hot water is passed through a filter comprising a porous support having a pore diameter in the range of from 5 to 200 μ having laminated thereon carbonaceous fibers, said fibers (a) having a carbon content of at least 85% by weight (b) a length in the range of from 0.1 to 5 mm (c) a diameter in the range of from 1 to 50 μ (d) acidic groups in a concentration of at least 0.01 meq/g on their surface, and (e) being laminated on the said support in an amount from 100 to 5000 g/m².

4,045,339

WASTE TREATMENT OF FLUOROBORATE SOLUTIONS

Theodore Frank Korenowski; Jerry Lee Penland, both of Zelienople, and Chalmer John Ritzert, Butler, all of Pa., assignors to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 602,180, Aug. 5, 1975, Pat. No. 4,008,162.
This application Oct. 18, 1976, Ser. No. 733,490
Int. Cl.² C02B *1/20*
U.S. Cl. 210—45 **5 Claims**



1. An integrated process for removing waste drag-out containing dissolved fluoroborates from work pieces that have been subjected to in line treatment in a fluoroborate bath and for pollution free disposal of process effluents which comprises

maintaining a first rinse zone containing an acidic solution, a second rinse zone containing a neutralizing solution, and a third rinse zone containing water; continuously moving the work pieces from the fluoroborate bath into and through each of the first, second and third rinse zones, whereby fluoroborate waste drag-out is substantially removed from surfaces of the work pieces into the acidic solution of the first rinse zone, and drag-out from the first rinse zone is substantially removed from said surfaces into the neutralizing solution of the second rinse zone, and drag-out from the second rinse zone is removed from the surfaces into the water of the third rinse zone; continuously passing the acidic solution containing the fluoroborate waste drag-out from the first rinse zone to a first treatment zone maintained at an elevated temperature of at least 130° F and at a pH of about 4 or less adding calcium ions to the first treatment zone to liberate fluoride values from the fluoroborate drag-out, wherein the total amount of calcium ions in the first treatment zone is sufficient to provide at least 0.25 times the potential molar fluoride value of the fluoroborate drag-out;

recirculating the acidic solution containing liberated fluoride values to the first rinse zone for further removal of fluoroborate waste drag-out;

continuously passing from the second rinse zone the neutralizing solution containing the drag-out from the first rinse zone including liberated fluoride values to a second treatment zone;

maintaining sufficient alkaline conditions in said second treatment zone to precipitate calcium fluoride; recirculating the neutralization solution depleted in fluoride values to the second rinse zone for further removal of drag-out from the first rinse zone; recovering precipitated calcium fluoride from the second treatment zone, and withdrawing spent rinse water from the third rinse zone.

4,045,340

METHOD FOR RECOVERING AND EXPLOITING WASTE OF THE CHROMIC ANHYDRIDE PRODUCTION

Diego Perrone, Cogoleto, Italy, assignor to Luigi Stoppani di P Stoppani & C., Milan, Italy

Filed July 13, 1976, Ser. No. 704,954
Claims priority, application Italy, Aug. 28, 1975, 26686/75
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—45 9 Claims

1. A process for treating the waste residue, resulting from the reaction of sodium bichromate and sulfuric acid in the production of chromic anhydride, to recover chromium values and other products therefrom, such waste residue consisting essentially of sodium bisulfate, sulfuric acid, and a hexavalent chromium compound consisting essentially of chromium trioxide, all of which are water-soluble, and a trivalent chromium compound consisting essentially of chromium bisulfate which is water-insoluble, said process comprising:

a. mixing said waste residue with water to form a first aqueous slurry comprising a solution containing sodium bisulfate, sulfuric acid, and chromic acid with the water-insoluble chromium bisulfate suspended therein;

b. forming a reaction mixture of the first aqueous slurry obtained in step (a) with an aqueous solution of sodium chromate, said reaction mixture having a specific gravity of about from 1.2 to 1.4 and a pH of about from 2 to 8, and heating said reaction mixture at a temperature of about from 70° to 250° C for about from 10 to 600 minutes, whereby part of the water-insoluble chromium bisulfate is converted into water-insoluble chromium chromate which precipitates out, thereby to obtain a second aqueous slurry comprising a solution containing sodium sulphate and sodium bichromate with the precipitated water-insoluble chromium chromate and the remainder of the unconverted, water-insoluble chromium bisulfate suspended therein;

c. curing the second aqueous slurry obtained from step (b), having a pH of about from 2 to 8, at a temperature of about from 70° to 250° C for about from 10 to 600 minutes to convert the remainder of the water-insoluble chromium bisulfate into water-insoluble chromium chromate thereby to obtain a third aqueous slurry comprising a solution containing sodium sulfate and sodium bichromate with the water-insoluble chromium chromate suspended therein; and

d. subjecting the third aqueous slurry obtained from step (c) to solid-liquid separation to recover a solid consisting essentially of chromium chromate and an aqueous solution containing sodium sulfate and sodium bichromate.

4,045,341

METHOD FOR THE DISPOSAL OF WASTE WATER CONTAINING AMMONIUM IONS, SULFATE IONS AND ORGANIC SUBSTANCES

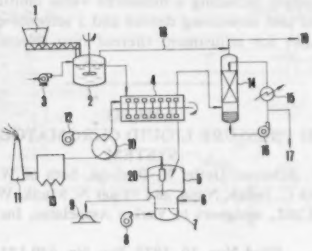
Hidemasa Tsuruta, Tokyo; Yoshiaki Kinoshita, Tachikawa, and Isao Tanaka, Tokyo, all of Japan, assignors to Nittetu Chemical Engineering Ltd., Tokyo, Japan

Filed Apr. 6, 1976, Ser. No. 674,161
Claims priority, application Japan, Jan. 22, 1976, 51-5485
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—45 5 Claims

1. A method for the disposal of a waste water containing ammonium ions, sulfate ions, and organic substances which comprises:

a. adding sufficient calcium hydroxide or calcium oxide to said waste water for reaction with the sulfate ions present in said waste water to form a precipitate of calcium sulfate and thereby liberating the ammonium ions in the form of ammonia in said waste water; then

b. contacting heated air with the waste water to distill off substantially all of said ammonia and a part of the water present in said waste water as a vapor and at the same time to produce an evaporation residue having a pH value of about 8.5 or more; and then



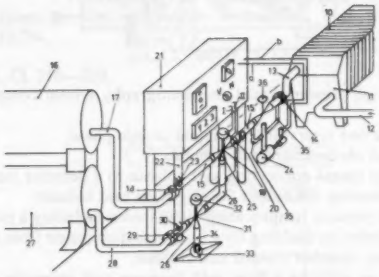
c. introducing said evaporation residue into a combustion furnace and burning said residue at a temperature in the range of from 700° C to 1000° C.

4,045,342

METHOD AND APPARATUS FOR FILTERING

Jürgen Küster, Bad Munster, and Hermann Schlosser, Guldental, both of Germany, assignors to Seitz-Werke GmbH, Bad Kreuznach, Germany

Filed Jan. 15, 1976, Ser. No. 649,408
Claims priority, application Germany, Jan. 17, 1975, 2501733
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—81 14 Claims



1. The method of operating a filtering system which includes a filter having a fluid inlet and a fluid outlet, a first receiving tank, a second receiving tank, a drain connection and valved conduits connecting the filter outlet with said tanks and said drain connection, said method comprising; continuously measuring the density of the fluid being discharged from the filter outlet, storing an initial measured value as a first reference value, adjusting the valves in said conduits to direct the flow from the filter when the measured value differs a predetermined amount from the stored value, thereafter storing successive measured values to form a changing second reference value and comparing the thus obtained second reference value with measured values in a time sequence, and again adjusting the valves to divert the flow from the filter when a condition of substantial equivalency exists between the stored value and the measured value.

9. A filter system which includes a filter having a fluid inlet and a fluid outlet, a first tank having an inlet, a second tank also having an inlet and a drain connection; a first conduit detachably connected to the filter outlet and also detachably connected to the inlet of the first tank, a first three way valve in said first conduit, a density measuring device on the upstream side of said first three way valve, a second conduit connected to said first three way valve and detachably connected to the inlet of said second tank, a second three way valve in said second conduit and a discharge conduit connected to said

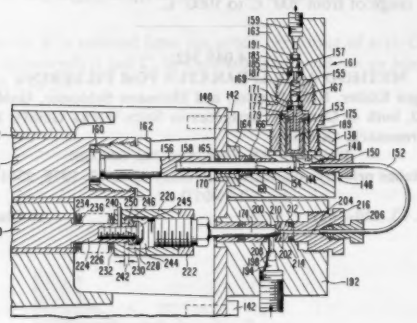
second three way valve and leading to said drain connection, said density measuring device being disposed directly adjacent said first three way valve on the upstream side thereof, said control means including a measured value emitter under the control of said measuring device and a selector connected to said emitter for adjustment thereof into selected operating modes.

4,045,343

HIGH PRESSURE LIQUID CHROMATOGRAPHY SYSTEM

Pierre Y. Achener; Detlef R. Boehme, both of Walnut Creek; Kenneth C. Judah, Napa, and Miner N. Munk, Walnut Creek, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 10, 1975, Ser. No. 630,122
Int. Cl.² B01D *15/08*
U.S. Cl. 210—101 **21 Claims**



1. A high pressure liquid chromatography system comprising:

at least one reservoir for a liquid mobile phase;

a liquid chromatographic column;

conduit means connecting said column to a detector means for sensing the output flowing from said column;

a high-pressure reciprocating pump means including a pump chamber for enabling flow via connecting means from said pump chamber toward said column;

structure defining a flow path between said reservoir and said pump chamber;

inlet valve means in said flow path between said reservoir and said pump chamber; and

motor means coupled to said pump means for driving same;

said motor means being mechanically linked to said inlet valve means for actuating said inlet valve means to enable flow of said mobile phase to said pumping chamber.

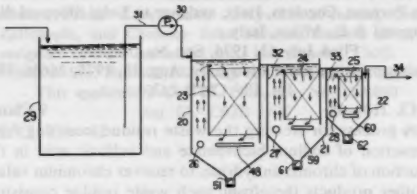
4,045,344

APPARATUS FOR TREATING WASTE WATER

Ittshu Yokota, Zentsuji, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan, a part interest

Filed Apr. 29, 1974, Ser. No. 465,102
Int. Cl.² C02C *1/04*
U.S. Cl. 210—106 **14 Claims**

1. An apparatus for treating waste water comprising at least one treating tank having an inlet for waste water and an outlet for treated water, at least one bundle of a number of straight tubes arranged in said treating tank so that the bundle is submerged in waste water to be treated in the tank, said bundle being provided with a plurality of crossing passages extending across the bundle which passages are arranged intermittently along the bundle with certain intervals therebetween so that each of the tubes is divided into a plurality of tube sections each having a length such that the length is substantially covered with a flow-disturbed portion due to flowing-in of water and another flow-disturbed portion due to flow-out of water in



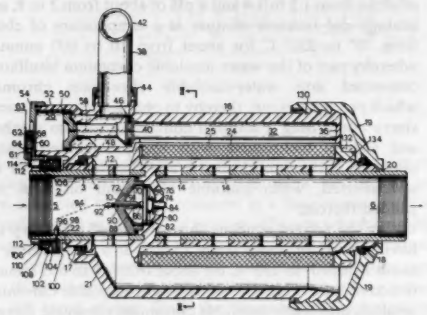
each tube section, and means for flowing waste water through said bundle in a direction along the bundle.

4,045,345

SELF-FLUSHING FILTER

Mordeki Drori, 89 Zahal Street, Kiron, Israel

Filed Sept. 29, 1976, Ser. No. 727,859
Claims priority, application Israel, July 30, 1976, 50171
Int. Cl.² B01C *29/38*
U.S. Cl. 210—107 **9 Claims**



1. A self-flushing filter, comprising: a housing including an inlet connectable to an upstream fluid pipe, and an outlet connectable to a downstream fluid pipe; a filter body disposed within the housing and having a cylindrical surface facing the inlet to intercept dirt particles in the fluid flowing in the forward direction through the filter body from the inlet to the outlet; a rotatable member defining a purging chamber having an inlet opening close to and facing said cylindrical surface of the filter body; a purging conduit fixed to the rotary member to rotate therewith; and valve means disposed between said purging chamber and purging conduit; said valve means being normally closed to block the flow of fluid from said purging chamber to the purging conduit but being openable to establish communication therebetween and thereby to cause the fluid to flow in the reverse direction through the filter body into the purging chamber and out through the purging conduit, whereby rotation of the rotatable member when the valve means are opened causes the purging chamber inlet opening to move along the cylindrical surface of the filter body as said reverse flow of fluid through the filter body flushes dirt particles from its cylindrical surface into said purging chamber and out through the purging conduit.

4,045,346

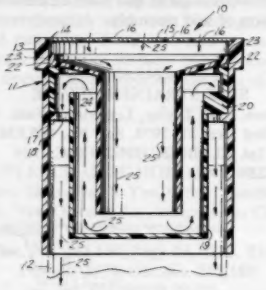
BASEMENT SEWER TRAP

Henry S. Swaskey, 2720 Hamilton Ave., Export, Pa. 15632

Filed Feb. 24, 1976, Ser. No. 660,874
Int. Cl.² E03F *5/06*
U.S. Cl. 210—164 **1 Claim**

1. A basement sewer trap, comprising in combination, a

cylindrical coupler sleeve, a radially inwardly flange on an inner face of said sleeve located along an intermediate portion of said inner face, a portion of said inner face below said flange fitting around an upper end of a sewer pipe, a portion of said inner face above said flange fitting an outer periphery of a cylindrical ring of a plastic cup which is supported on said coupler sleeve inward flange, said plastic cup including a cylindrical side wall, a circular bottom wall at a lower end of said cup side, and said ring being concentrically spaced around an upper edge of said cup, said plastic cup depending downwardly into a center of an upper end of said sewer pipe, said cup ring being joined with said cup side wall by a pair of diametrically spaced apart webs therebetween, a funnel tube of



cylindrical shape being concentrically within said cup, an upper edge of said funnel tube being integral with a radially outwardly conically-shaped flange which at its outer periphery fits said inner face of said coupler sleeve and rests upon an upper edge of said cup ring, and an upper end of said coupler sleeve having a circular recess in which is fitted a circular water strainer having a plurality of openings therethrough, for drain water to pass therethrough, then down through said funnel tube, then up in said cup around an outer side of said funnel tube, then over a top of said cup and down through spaces between said cup side wall and said cup ring so as to flow down around an outer side of said cup side wall and down into said sewer pipe.

4,045,347

SYSTEM FOR POLLUTION SUPPRESSION

Edward T. Armstrong, Butler, N.J., assignor to Tii Corporation, Lindenhurst, N.Y.

Division of Ser. No. 531,095, Dec. 9, 1974, Pat. No. 3,998,714, which is a continuation-in-part of Ser. No. 355,738, April 30, 1973, Pat. No. 3,853,764, which is a continuation-in-part of Ser. No. 100,333, Dec. 21, 1970, Pat. No. 3,730,881, which is a continuation-in-part of Ser. No. 813,382, Feb. 28, 1969, Pat. No. 3,549,528, which is a continuation-in-part of Ser. No. 362,118, April 23, 1964, abandoned. This application May 4, 1976, Ser. No. 682,962

Int. Cl.² C02B *3/06*

U.S. Cl. 210—199 **18 Claims**

1. A disinfectant mixing system for an influent treatment system utilizing a contact tank which comprises

an influent inlet port into the contact tank,

a manifold fed by the inlet port,

a pipe bundle fed by said manifold,

a flat plate orifice high momentum exchange mixing member in each pipe in said bundle,

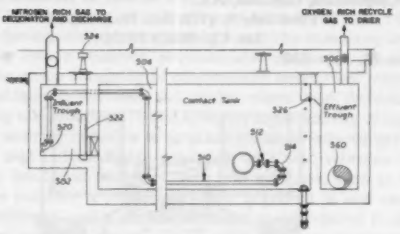
means for injecting a disinfecting fluid into each pipe at the point of highest momentum exchange,

an influent well,

means to effect influent flow from the influent well to the contact tank,

an effluent well,

means to effect flow from the contact tank to the effluent well, and



a hyperbolic transformed diffuser to deliver the influent from the pipe bundle to the influent well.

4,045,348

FILTER PRESS PLATE FOR LAYER AND SETTLING LAYER FILTERS

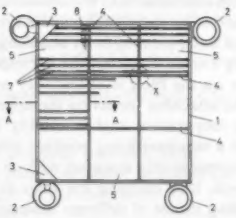
Fritz Strub, St. Gall, Switzerland, assignor to Filtrox Maschinebau Ag, St. Gall, Switzerland

Filed Nov. 11, 1975, Ser. No. 630,902

Claims priority, application Switzerland, Nov. 15, 1974, 15232/74

Int. Cl.² B01D *25/12*

U.S. Cl. 210—230 **9 Claims**



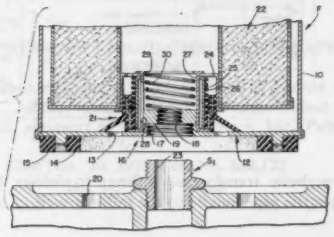
1. A filter press plate for layer and settling layer filters comprising a frame of stainless steel which defines at least one internal area, said frame having exteriorly projecting hollow eyes forming when a plurality of elements are stacked together in use manifolds for supplying and removing the liquid being filtered and passages connecting the interior of said eyes with the internal area of the frame, and within said internal area at least one separate partition plate of corrosion resistant material for supporting the filtering material, each said at least one partition plate extending over substantially the entirety of the corresponding internal area and being spaced along its exterior edges from the adjacent interior edges of said frame a distance sufficient to accommodate any difference in the heat expansions of said at least one plate and frame at the maximum temperature to which the filter press plate is to be exposed, each said at least one partition plate and frame having cooperating lugs and recesses on their adjacent exterior and interior edges for detachably securing the plate within the frame, each said at least one partition plate having its side faces profiled to form channels for supplying and removing the liquid being filtered.

4,045,349

FILTER WITH MULTIPLE ATTACHING MEANS

Kingsley E. Humbert, Jr., Gastonia, N.C., assignor to Wix Corporation, Gastonia, N.C.

Filed July 9, 1976, Ser. No. 703,913
Int. Cl.[2] B01D *27/08*
U.S. Cl. 210—232 **9 Claims**



1. A spin-on filter comprising: a housing having opposite ends, one of said ends having fluid inlet and outlet openings therein; cooperating male and female attaching means on said one end of the filter and on an apparatus with which the filter is to be used, for securing the filter to the apparatus to obtain fluid communication between the apparatus and the interior of the housing, said attaching means on the filter comprising multiple, axially arranged members of different diameters for cooperation with respective corresponding attaching means of different diameters on the apparatus, said members positioned axially adjacent one another and including an inner member and an outer member, the outer member having a larger diameter than the inner member; and means releasably holding one of said members adjacent the other of said members, whereby when the filter is positioned to be secured to an attaching means on the apparatus having a large diameter, the corresponding large diameter member on the filter is operatively engaged with and secured to the attaching means on the apparatus, and and other member is inoperative, and when the filter is positioned to be secured to an attaching means on the apparatus having a small diameter, the corresponding small diameter member on the filter is operatively engaged with and secured to the attaching means on the apparatus, and the other member is inoperative, said releasably held member being movable to a non-interfering position when the other of said members is operatively engaged with an attaching means on the apparatus, thus enabling the filter to be selectively used with attaching means of different diameter.

4,045,350

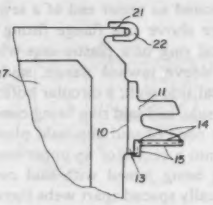
FILTER ASSEMBLY MADE OF THERMOPLASTIC MATERIALS

Lubomir Kupf, Prague, and Mirko Mursec, Pardubice, both of Czechoslovakia, assignors to Statni Vyzkumny Ustav Materialu, Prague, Czechoslovakia

Filed Mar. 19, 1975, Ser. No. 560,109
Int. Cl.[2] B01D *39/14;* **C02C** *1/22*
U.S. Cl. 210—232 **7 Claims**

1. In a filter assembly having filter support and filter frame elements, the improvement which comprises the elements of:

A monolithic filter support of expanded thermoplastic, the extended surfaces of said filter support being of greater density than the interior thereof to provide a structure of relative high strength and low weight; said filter support comprising as an integrated element of its monolithic structure, an upper edge which extends over two upper beveled corners of said filter support to form clamping projection means which function to hold a filter element means on said filter support in cooperation with independent clip means; said elements cooperatively functioning



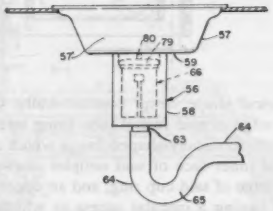
to facilitate adjustment of said filter element means during the operation of said assembly.

4,045,351

SINK STRAINER DEVICE

Carl M. Peterson, 2746 Taylor, Longview, Wash. 98632

Filed Dec. 31, 1975, Ser. No. 645,836
Int. Cl.[2] B01D *35/02;* **E03C** *1/26*
U.S. Cl. 210—238 **1 Claim**



1. A disposable strainer device for mounting in the bottom of a sink, said strainer device comprising a sink having an opening in the bottom thereof, a vertically elongated cylindrical sleeve mounted beneath the sink and having its upper edges fixed about the opening in the sink to provide fluid communication between the opening in the sink and the sleeve, said cylindrical sleeve having an opening in the bottom, an elongated outlet pipe having an elongated cylindrical upper portion of reduced diameter relative to the sleeve and fixed about the opening in the sleeve to provide fluid communication between the lower end of the sleeve and the drain outlet pipe, a vertically elongated perforated cylindrical receptacle holder detachably fitted onto said cylindrical sleeve downward through the opening in the sink, said receptacle holder being open at the top and having a diameter greater than the object pipe and only slightly smaller than the sleeve, a disposable perforated vertically elongated receptacle holder opening at the top and detachably fitted into said first mentioned cylindrical receptacle holder downward through the opening in the sink and through its opening at the top of the first receptacle holder, and having a diameter greater than the drain outlet and only slightly smaller than the first mentioned receptacle holder, said sink opening has a diameter greater than said first mentioned and said disposable receptacle holder whereby the holders may be inserted and fitted downward into the cylindrical sleeve and removed upward from the cylindrical sleeve through said sink opening, and whereby said disposable holder may receive and strain and retain therein refuse from fluid coming down the sink opening and may be removed upward through the sink opening with the first mentioned receptacle holder remaining in place in the cylindrical sleeve, said first cylindrical receptacle holder having a vertical length of at least equal to a majority of the vertical length of the sleeve, said cylindrical sleeve having an annular ledge fixed about its upper edge and said first mentioned receptacle holder has an outward projecting annular collar fixed about its upper edge whereby said collar of

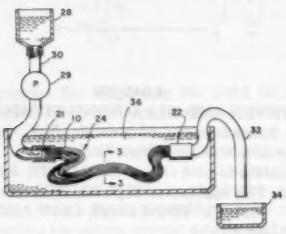
said receptacle can rest upon said ledge of the cylindrical sleeve, said second mentioned disposable receptacle holder has an annular collar fixed about its upper edge whereby said collar of said second receptacle holder may rest upon said collar of said first mentioned receptacle holder, said first mentioned receptacle holder having a stem fixed centrally to the bottom of the first receptacle and projecting upward therefrom, said second mentioned receptacle holder having a hollow column shaped portion fixed centrally to its bottom with an opening in the bottom into the column shaped portion whereby the stem may be received into the column portion to stack the first and second mentioned receptacle holders together, said device having a detachable cap, said ledge of said sleeve being spaced sufficiently beneath said opening in said sink, whereby said cap may be fitted into said sleeve in said space therebeneath and said cap being narrower in height than said space therebeneath said sink opening and said ledge whereby said cap when fitted into said space has its upper surfaces beneath the upper surfaces of sink immediately adjacent the sink opening and is adjacent the tops of the receptacle holders.

4,045,352

ION-EXCHANGE HOLLOW FIBERS

Alan Rembaum; Shiao-Ping S. Yen, both of Altadena, Calif., and Elias Klein, New Orleans, La., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 363,130, May 23, 1973. This application Feb. 24, 1975, Ser. No. 552,158
Int. Cl.[2] B01D *39/00*
U.S. Cl. 210—500 M **11 Claims**



1. An ion-exchange medium comprising a hollow, annular, thin-wall, microporous fiber of a synthetic, organic, thermoplastic resin having pores having an average diameter less than 1000 angstroms which join to form a path across the wall of the fiber and having solid particles of a cross-linked, insoluble ion-exchange resin formed in situ in said pores from ion-exchange reactants of a molecular weight capable of impregnating the pores having a diameter smaller than the pore diameter and having an even distribution of fixed charge embedded and constrained within said pores without blocking said pores of said path such that said medium has a hydraulic permeability of from 1 to 100 $\times$ 10^{-5} mil/cm^2 sec atm.

4,045,353

HIGH-ENERGY RADIATION INDUCED POLYMERIZATION ON A CHROMATOGRAPHIC SOLID SUPPORT

Yujiro Kosaka, Shin-nanyo; Masaru Uemura, Yokohama; Tsutomu Hashimoto, and Kazuyuki Fukano, both of Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Jan. 24, 1975, Ser. No. 543,800
Claims priority, application Japan, Oct. 15, 1974, 49-118374
Int. Cl.[2] B01D *39/00, 39/14*
U.S. Cl. 210—502 **12 Claims**

8. A chromatography solid support which comprises a microporous solid inorganic substrate selected from the group consisting of silica, silica gel, alumina, diatomaceous earth, zeolite, porous glass, active carbon, carbon black and clay, having a polymer coating thereon, and having an average particle diameter of 1μm to 1 cm, an average specific surface area of 1 – 2000 m^2/g, an average pore diameter of 10 to 1900 A, and having said polymer coating formed by immersing said substrate into a radiation polymerizable monomer selected from the group consisting of ethylenically unsaturated monomers, aldehydes, ketones and cyclic ethers, and thereafter exposing said monomer coated substrate to the activity of high energy ionizing radiation to produce radiation-induced grafting of said polymerizable monomer onto said substrate to thereby bond said monomer onto said substrate, such as to produce polymer, a portion of which is grafted to said inorganic substrate, and a portion of which is not bonded to the inorganic substrate, the amount of grafter polymer per amount of inorganic substrate being defined by the equation;

$$A(g/\text{grams of inorganic substrate}) = (S \times m)/(a \times N)$$

wherein:
S=specific area of inorganic substrate (m^{2}g)
a=sectional area of one molecule of monomer (A^2)
m=molecular weight of the monomer
N-Avogadro's number

12. A method for forming a chromatography solid support which comprises immersing a microporous solid substrate selected from the group consisting of silica, silica gel, alumina, diatomaceous earth, zeolite, porous glass, carbon black, active carbon and clay, into a radiation polymerizable monomer selected from the group consisting of ethylenically unsaturated monomers, aldehydes, ketones and cyclic ethers, and thereafter exposing said monomer coated substrates to the activity of high energy ionizing radiation to produce radiation-induced grafting of said polymerizable monomer onto said substrate to thereby bond said monomer onto said substrate, wherein said support is characterized by an average particle diameter of 1μm to 1 cm, an average specific surface are of 1 – 2000 m^2/g and an average pore diameter of 10 to 1500 A, such as to produce polymer, a portion of which is grafted to said inorganic substrate, and a portion of which is not bonded to the inorganic substrate, the amount of grafter polymer per amount of inorganic substrate being defined by the equation;

$$A(g/\text{grams of inorganic substrate}) = (S \times m)/(a \times N)$$

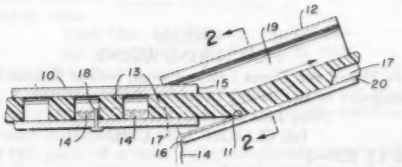
wherein:
S=specific area of inorganic substrate (m^{2}g)
a=sectional are of one molecule of monomer (A^2)
m=molecular weight of the monomer
N-Avogadro's number

4,045,354

DEVICE FOR SEPARATION OF LIQUID FROM PASTE OR SEMI-SOLID

Charles E. Wyman, South Hadley, Mass., and Robert D. Holstead, Ruston, La., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 1, 1974, Ser. No. 456,495
Int. Cl.[2] B01D *17/00*
U.S. Cl. 210—523 **5 Claims**



1. Apparatus for separating a low viscosity liquid from an

immiscible high viscosity paste, and apparatus comprising in combination a compaction conduit for the liquid and paste in fixed relation and projecting proximate to an upwardly inclined surface for receiving a compacted liquid and paste, the surface provided with means for gravity drainage of the low viscosity liquid wherein said conduit has at least one means for forming a drain passage in said paste.

3. Apparatus for separating a low viscosity liquid from an immiscible high viscosity paste, said apparatus comprising in combination a compaction conduit for the liquid and paste in fixed relation and projecting proximate to an upwardly inclined surface for receiving a compacted liquid and paste, the surface provided with means for gravity drainage of the low viscosity liquid wherein said inclined surface is a screw pump rotor flight.

4,045,355

CLARIFICATION PLANT

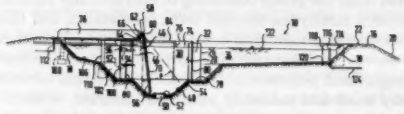
Josef Schleich, Pfarrkirchen, and Hans Zwisler, Unterpfaffenhofen, both of Germany, assignors to Heilmann & Littmann Bau-Aktiengesellschaft, Munich, Germany

Filed June 4, 1976, Ser. No. 693,109

Claims priority, application Germany, June 11, 1975, 2525909; Oct. 10, 1975, 2545406; Nov. 4, 1975, 2549270; Dec. 5, 1975, 2554768

Int. Cl.² B01D *21/02*

U.S. Cl. 210—532 R **15 Claims**



1. A clarification plant for aqueous waste comprising:

a. an embankment and a bottom wall upwardly flaring toward said embankment,

1. said embankment being of oval contour in plan view;

2. said bottom wall and said embankment bounding a basin open in an upward direction;

b. a plurality of upright partitions in said basin,

1. said partitions being annular about an upright axis and spaced from each other radially relative to said axis to define in said basin an innermost settling area, an activating area surrounding said settling area, and a clarifying area surrounding said activating area,

2. a portion of said embankment extending in an arc spacedly adjacent the radially outermost of said partitions,

3. the remainder of said embankment extending away from said outermost partition farther than said portion thereof and bounding a radially elongated portion of said clarification area,

4. a portion of said bottom wall downwardly bounding said clarifying area and sloping upwardly from said outermost partition toward said remainder of said embankment more gently than toward said portion of the embankment;

c. inlet means for admitting waste to said settling area;

d. outlet means for releasing clarified water from said portion of said clarifying area.

4,045,356

FRACTURING AGENT

Steve Eisner, and James LeRoy Powell, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 24, 1963, Ser. No. 290,237

Int. Cl.² B26F *3/00*; C22C *7/00*

U.S. Cl. 225—2 **17 Claims**

1. A fracturing solution for aluminum alloys, titanium alloys, copper-base alloys, iron alloys and steels comprising a first component of 98% to 99.8% mercury and 2% to 0.2% alkali metal selected from the group consisting of sodium, cesium potassium, and lithium and a second component of at least 1% of at least 0.0001N metallic sulfate solution selected from the group consisting of gold sulfate, copper sulfate and silver sulfate.

4,045,357

HYDROXY-ALUMINUM BASED DRILLING FLUID

Marion G. Reed, Hacienda Heights, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 574,810, May 5, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 725,807

Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **3 Claims**

1. An aqueous drilling fluid comprising an aqueous hydroxy-aluminum solution having a ratio of the hydroxyl groups to aluminum atoms in the range of from 1.0 to 2.7 and a concentration of at least 0.5 molar, from 0.1 to 0.5% by weight of a polymer selected from the group consisting of polyvinylpyrrolidone and polyvinyl alcohol for viscosity control and an effective amount of a polyalkyl substituted nitrogen containing heterocyclic compound for corrosion control.

4,045,358

SOFTENER AND BLEACHING COMPOSITION

Pallassana Ramachandran, Robinsville, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

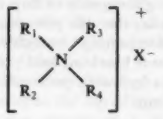
Continuation-in-part of Ser. No. 366,329, June 4, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,815

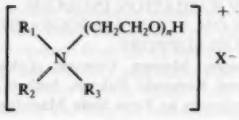
Int. Cl.² D06M *13/46*; C11D *3/60*

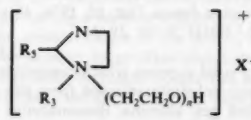
U.S. Cl. 252—8.6 **10 Claims**

1. A non-yellowing fabric softening composition comprising

a. a quaternary ammonium compound selected from the group consisting of those having the formulae:







wherein R_1 is a long chain aliphatic radical having from 18 to 22 carbon atoms, R_2 is a long chained aliphatic radical having from 18 to 22 carbon atoms, R_3 and R_4 are lower alkyl radicals, e.g. C_1 to C_4, R_5 is long chain aliphatic radical of from 12–22 carbon atoms, *n* is a number between 1 and 15 and X is a water soluble salt forming anion,

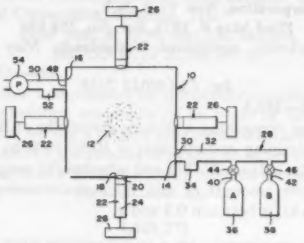
b. and a perphthalic acid bleach in a weight ratio of (a) to (b) of from 4:1 to 1:1.

4,045,359

APPARATUS FOR PHOTON EXCITED CATALYSIS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Melvin M. Saffren, Altadena, Calif.

Filed Jan. 29, 1976, Ser. No. 653,316
Int. Cl.² B01J *1/00*
U.S. Cl. 250—527 **8 Claims**



1. An apparatus for increasing the yield of photonically excited gas phase reactions comprising in combination:

a closed gas phase reactor having a reaction chamber, an inlet for flowing a gas reactant to the reaction chamber, an outlet for removing a stable gaseous reaction product from the reactor and at least one aperture;

photon source means disposed outside said reactor including a laser having the output photon emitter end connected to said aperture in optical alignment with said chamber for directing excess light energy onto the inlet gas reactant for forming at least one highly excited unstable gas species containing excess energy; and

finely divided, solid, energy sink means disposed in said reactor between the inlet and outlet for stabilizing said unstable, excited species by contacting and absorbing excess energy therefrom to form said stable gaseous reaction product.

4,045,360

INHIBITING WAX DEPOSITION FROM A WAX-CONTAINING OIL

Paul W. Fischer, Whittier, and John W. Scheffel, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Sept. 22, 1975, Ser. No. 615,837
Int. Cl.² E21B *43/00*; **C09K** *3/00*
U.S. Cl. 252—8.3 **8 Claims**

1. A method for inhibiting the deposition of wax from wax-containing oil comprising incorporating into said oil a wax deposition inhibitor comprising an effective amount of a mixture of (A) one part by weight of a copolymer of ethylene and a monoethylenically unsaturated ester selected from the group consisting of (1) vinyl and allyl esters of saturated aliphatic carboxylic acids and (2) saturated aliphatic esters of unsaturated aliphatic carboxylic acids, and (B) about 2 to about 5 parts by weight of one or more oxygen-containing organic compounds selected from the group consisting of high molecular weight alcohols selected from the group consisting of unsubstituted saturated aliphatic, unsubstituted unsaturated aliphatic and unsubstituted alicyclic monohydroxy alcohols having about 10 to about 20 carbon atoms, natural waxes selected from the group consisting of insect and vegetable waxes, and fatty acids selected from the group consisting of palmitic, stearic, oleic and linoleic acids.

4,045,361

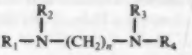
FABRIC CONDITIONING COMPOSITIONS

David M. Watt, Jr., Cincinnati, and Joseph P. Nirschl, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 21, 1975, Ser. No. 579,740
Int. Cl.² C09K *3/16*; **D06M** *13/36, 13/46*
U.S. Cl. 252—8.8 **11 Claims**

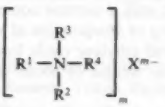
1. Liquid rinse-added fabric conditioning compositions comprising:

a. from about 0.5 to about 50% by weight of a static control agent selected from the group consisting of water-soluble acid salts of diamine compounds of the formula



wherein *n* ranges from 2 to 5; R_1 is an alkyl group containing from about 12 to 200 carbon atoms; and R_2, R_3 and R_4 are each hydrogen or alkyl groups containing 1 to 20 carbon atoms, provided that at least two of R_2, R_3 and R_4 are each hydrogen or alkyl containing from about 1 to about 3 carbon atoms, said salts having a solubility in water of at least 1 gram per liter at 25° C;

b. from about 0.5% to about 20.0% by weight of a quaternary ammonium fabric softener selected from the group consisting of compounds of the formula



wherein R^1 is an alkyl group containing from about 12 to 20 carbon atoms; R^2 is alkyl of about 1 to 20 carbon atoms, R^3 and R^4 are each alkyl of about 1 to 3 carbon atoms; X is a non-interfering anion; and *m* is 1 when X is monovalent and *m* is 2 when X is divalent; and

c. from about 50 to 98% by weight of water; said composition having a pH value within the range of from about 3 to 9.

4,045,362

DEFLATED TIRE LUBRICANT

Tiong H. Kuan, Akron, and John G. Sommer, Hudson, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 12, 1976, Ser. No. 666,516
Int. Cl.² C10M *5/00, 7/00, 1/06, 3/04*
U.S. Cl. 252—14 **3 Claims**

1. A stable lubricant for a pneumatic tire for use when the tire is operated in an uninflated or deflated condition, said lubricant comprising:

a. 100 parts of a water/ethylene-glycol mixture wherein there is at least one part of water for every 4 parts of ethylene glycol;

b. from about 0.05 to about 2 parts by weight of a polyethylene oxide of a molecular weight of about 500,000;
c. from about 0.15 to about 2 parts by weight of a polysaccharide having a molecular weight of at least about 10,000; and
d. up to 8 parts by weight of cellulose fibers, said fibers having a length not more than 400 microns;
a lubricant of a viscosity such that the fibers will remain dispersed when the tire is subjected to 200 g's at 70° C.

4,045,363
INVERT EMULSIONS OF IMPROVED EXTREME PRESSURE PROPERTIES

Donald A. Lee, Aurora, and Philip S. Korosec, Mentor, both of Ohio, assignors to The Elco Corporation

Filed Nov. 7, 1975, Ser. No. 629,763
Int. Cl.[2] C10M *1/06*
U.S. Cl. 252—49.5 **9 Claims**

1. A stable water-in-oil emulsion, suitable as a fire resistant fluid, comprising 50–80 parts mineral oil, 20–50 parts water and 2–10 parts of the reaction product of (1) the reaction product of sulfur with a mixture of polyisobutenyl succinic anhydride, at least one member selected from the group consisting of animal oil, mono esters of unsaturated fatty acids and vegetable oil, and a mono-alpha-unsaturated olefin and (2) a hydrophile selected from the group consisting of ammonia, alkyl amines, aryl amines, polyamines, alcohols and alcoholamines wherein the reaction product (1) is formed at a temperature within the range of from about 175° to 200° C, and, wherein the reaction product of (1) and (2) is formed at the reflux temperature of the mixture of components (1) and (2).

4,045,364
IODOPHOR SOAP TISSUES

Ferdinand Joseph Richter, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 634,569, Nov. 24, 1975, abandoned. This application June 11, 1976, Ser. No. 695,226
Int. Cl.[2] A61K *33/18*; C11D *3/48*
U.S. Cl. 252—106 **4 Claims**

1. A single use wet strength paper useful in germicidal cleansing procedures impregnated with a mixture comprising:
a. a nonionic detergent consisting of condensates of propylene oxide, propylene glycol and ethylene oxide forming a compound having a molecular weight of about 5,000 to about 10,000, about 18 parts;
b. an anionic detergent consisting of sodium N-coconut-acid-N-methyl taurate, about 26 parts;
c. an anionic detergent consisting of a coconut-oil acid ester of sodium isethionate, about 1 part;
d. iodine, about 2.6 parts;
e. sodium iodide about 1.5 parts;
f. isopropanol about 5.0 parts;
g. a weak organic acid, about .2 parts; and
h. water, about 45.4 parts.

4,045,365
AZEOTROPE-LIKE COMPOSITIONS OF TRICHLORO-TRIFLUOROETHANE, ACETONITRILE AND ACETONE

Francis J. Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 686,208, May 13, 1976, abandoned. This application Nov. 16, 1976, Ser. No. 741,633
Int. Cl.[2] C11D *7/50, 7/32, 7/30*
U.S. Cl. 252—141 **4 Claims**

1. Azeotrope-like compositions comprising about 90.62 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane, about 1.91 weight percent acetonitrile and about 7.47 weight percent acetone.

4,045,366
AZEOTROPE-LIKE COMPOSITIONS OF TRICHLOROTRIFLUOROETHANE, NITROMETHANE AND ACETONE

Francis J. Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 686,209, May 13, 1976, abandoned. This application Nov. 16, 1976, Ser. No. 741,634
Int. Cl.[2] C11D *7/50, 7/32, 7/30*
U.S. Cl. 252—171 **4 Claims**

1. Azeotrope-like compositions comprising about 90.25 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane, about 0.33 weight percent nitromethane and about 9.42 weight percent acetone.

4,045,367
GETTER FOR USE IN THE MANUFACTURE OF AN ELECTRIC DISCHARGE TUBE

Adrianus Maria Van Bakel, and Jan Josephus Bernardus Fransen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1973, Ser. No. 358,636
Claims priority, application Netherlands, May 11, 1972, 7206375
Int. Cl.[2] H01J *7/18*
U.S. Cl. 252—181.4 **1 Claim**

1. A getter comprising a mixture essentially of $BaAl_4$ and a titanium-containing material that is 10 to 50% by weight of Ni_3Ti and the balance Ni Ti_2, and wherein the weight ratio of the respective amounts of said titanium-containing material and said $BaAl_4$ is between 0.3 and 1.

4,045,368
PROCESS FOR PRODUCTION OF ACTIVATED CARBON SPHERES

Kunihiko Katori, Tokyo; Hiroshi Nagai, Chofu, and Zenya Shiiki, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of Japan

Filed Oct. 25, 1974, Ser. No. 518,084
Claims priority, application Japan, Oct. 29, 1973, 48-120653
The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.
Int. Cl.[2] B01J *37/00*
U.S. Cl. 252—421 **6 Claims**

1. A process for the production of activated carbon spheres, comprising:
melting 100 parts by weight of a pitch in the presence of 10 to 50 parts by weight of naphthalene or tetralin to form a molten mixture;
shaping said molten mixture into the form of spheres;
contacting said spheres with a second solvent, said second solvent being compatible with the aromatic solvent, but lacking affinity for the pitch, to extract said aromatic solvent and to form microporous spheres;
oxidizing said microporous spheres by heating said spheres at a temperature of from 100° C to 400° C in the presence of a gas containing 5–30% by volume oxygen to produce pitch spheres containing at least 10% by weight of combined oxygen; then
heating said pitch spheres at a temperature in the range of from 150° C to 700° C in the presence of ammonia to produce pitch spheres having at least 1.5% by weight combined nitrogen; and
activating said pitch spheres.

4,045,369

SILVER-BASED CATALYTIC COMPOSITION FOR THE OXIDATION OF ETHYLENE TO ETHYLENE OXIDE AND METHANOL TO FORMALDEHYDE

Angelo Cantaluppi, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Mar. 26, 1976, Ser. No. 670,954
Claims priority, application Italy, Apr. 2, 1975, 21923/75; Mar. 11, 1976, 21076/76
Int. Cl.[2] B01J *21/04, 21/08, 23/08, 23/50*
U.S. Cl. 252—432 13 Claims

1. Catalytic composition based on silver comprising:

A. from 0.001 to 10% based on the weight of silver of an oxide of a metal selected from the group consisting of barium, strontium and calcium,

B. from 0.001 to 8% based on the weight of silver of an oxide of indium,

C. the balance consisting essentially of silver.

4,045,370

CATALYST FOR THE DEPOLYMERIZATION OF LOWER POLYMERS OF ISOBUTENE

William Ronald Cares, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Mar. 8, 1976, Ser. No. 664,901
Int. Cl.[2] B01J *21/08, 23/30*
U.S. Cl. 252—458 1 Claim

1. A catalyst composition for the depolymerization of olefin polymers consisting essentially of an oxide of tungsten on a silica support having a surface area over 50 square meters per gram prepared by the process of mixing an aqueous solution of $H_4SiW_{12}O_{40}$ onto a silica gel and drying the mixture.

4,045,371

PROCESS FOR PREPARING A GAS DESULFURIZATION SORBENT

Kenneth S. Wheelock, and Geoffrey R. Say, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 536,164, Dec. 24, 1974, Pat. No. 4,002,720. This application June 8, 1976, Ser. No. 693,875
Int. Cl.[2] B01J *21/04, 23/10*
U.S. Cl. 252—462 7 Claims

1. A process for preparing a supported sorbent for removing at least a portion of acidic gases from a gaseous mixture containing an acidic gas selected from the group consisting of hydrogen sulfide, carbonyl sulfide and mixtures thereof, which process comprises: first steam treating an inorganic oxide support for a period of time sufficient to decrease the surface area thereof, subsequently impregnating the steam-treated support with a solution of a rare earth metal compound thermally decomposable to the oxide, drying and calcining said impregnated support.

4,045,372

CONTROL OF PHYSICAL PROPERTIES OF ALUMINA EXTRUDATES

John Lawrence Warthen, Baltimore; Warren Stanley Briggs, Silver Spring, both of Md., and Marvin Vernon Paggen, Sulphur, La., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 606,275, Aug. 20, 1975, abandoned. This application July 1, 1976, Ser. No. 701,679
Int. Cl.[2] B01J *21/04*
U.S. Cl. 252—463 5 Claims

1. A process for preparing an auto exhaust conversion catalyst which consists essentially of the steps of:

a. preparing an alpha alumina monohydrate in the 10 to 150 micron size range,

b. adding a sufficient quantity of water to form an extrudable paste,

c. aging said paste at ambient temperatures for 0.5 to 6 hours,

d. extruding the alumina to form extrudates,

e. drying and calcining the extrudates,

f. contacting the extrudates with solutions of salts of metals having activity for conversion of the noxious components of exhaust gases to innocuous entities,

g. drying, calcining and recovering the product.

4,045,373

OXIDATION CATALYSTS AND PROCESS FOR PREPARING SAME

Robert A. Innes, Pittsburgh, and Anthony J. Perrotta, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 30, 1975, Ser. No. 645,418
Int. Cl.[2] B01J *23/14, 23/16*
U.S. Cl. 252—469 5 Claims

1. A novel catalyst defined by the following stoichiometry: $USb_aSn_bO_{8-12}$, wherein a is the number about 2.5 to about 1.5 and b is the number about 0.5 to about 1.5, with the atomic ratio of the sum of antimony and tin to uranium being about 2.5:1 to about 3.5:1.

4,045,374

ZINC OXIDE VOLTAGE-NONLINEAR RESISTOR

Masahiro Nagasawa, Hirakata; Yasuo Wakahata, Chitose; Kensuke Kuchiba, Hirakata; Kunio Nishi, Chitose, and Hiroshi Abe, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 10, 1975, Ser. No. 621,622
Int. Cl.[2] H01B *1/00*
U.S. Cl. 252—517 5 Claims

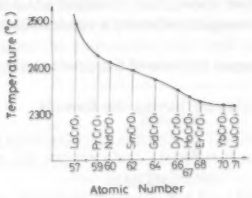
1. A voltage-dependent resistor of bulk type comprising a sintered body consisting essentially of a voltage-dependent composition which comprises, as a main constituent, zinc oxide (ZnO) and, as an additive, at least one member selected from the group consisting of bismuth oxide (Bi_2O_3), barium oxide (BaO), strontium oxide (SrO), lead oxide (PbO) and uranium oxide (UO_2), and, as a further additive, at least one member selected from the group consisting of aluminum oxide (Al_2O_3), indium oxide (In_2O_3) and gallium oxide (Ga_2O_3) in an amount of 1×10^{-4} to 5×10^{-3} mole per 100 moles of ZnO, and electrodes applied to opposite surfaces of said sintered body.

4,045,375

HIGHLY ELECTRON-CONDUCTIVE COMPOSITION

Masao Komatu, Tokyo, Japan, assignor to Koshi Arita, Tokyo, Japan

Filed Nov. 24, 1975, Ser. No. 634,632
Claims priority, application Japan, June 20, 1975, 50-75855
Int. Cl.[2] H01B *1/08*
U.S. Cl. 252—519 6 Claims



1. A highly electron-conductive composition comprising a multiple oxide having the general formula:

$$(L_{1-x}M_x)(Q_{1-y}R_y)O_3$$

in which L is an element selected from the group consisting of La, Pr, Nd, Yb, Gd and Lu; M is an element selected from the group consisting of Ca, Sr and Ba; QR is a pair of elements

selected from the group consisting of CrNi, ZrMn, FeTi, FeCo, and NiCu; and $0 \leqq x < 0.5$ and $0.2 < y < 0.8$.

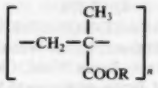
4,045,376

SYNTHETIC TURBINE OILS

Isaac D. Rubin, Wappingers Falls, N.Y., and John W. Nebzydoski, Miami, Fla., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,531
Int. Cl.² C10M *1/28*
U.S. Cl. 252—56 S **9 Claims**

1. A synthetic lubricating oil composition comprising a major amount of an aliphatic ester base oil having lubricating properties and formed by the reaction of a pentaerythritol or trimethylolpropane and an organic acid having from about 2 to about 12 carbon atoms per molecule together with a pour point depressant amount of a mixture of a mineral oil having lubricating properties and a pour point ranging from −40° F to +35° F with a copolymer of two or more esters of methacrylic acid characterized by the formula:



wherein R is a radical ranging from butyl to stearyl and n is an integer giving a molecular weight to said polymer ranging from 5000 to 500,000.

4,045,377

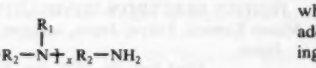
CATIONIC POLYMER PREPARED FROM DICYANDIAMIDE, A POLYAMIDE, A DIALKYLAMINE, AND AN EPOXIDE

Stephen C. Pearson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 20, 1975, Ser. No. 624,212
Int. Cl.² B01D *21/01*; C02B *1/20*; C08G *73/02, 59/18*
U.S. Cl. 260—2 BP **12 Claims**

1. A process for the preparation of a water-soluble cationic polymer comprising:

a. reacting and polyalkylenepolyamine having the formula



wherein R_1 is hydrogen, C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl; R_2 is independent of the other R_2 and is an alkylene radical having from 2 to 6 carbon atoms and x is an integer of 1 to 5 and dicyandiamide in a mole ratio of polyalkylenepolyamine to dicyandiamide of from about 1.2/1 to about 1/1.2 until reaction is substantially complete whereby a condensation polymer is produced,

b. forming an aqueous solution of the condensation polymer of step (a),

c. admixing dialkylamine having the formula

wherein R_3 is independent of the other R_3 and is a C_1–C_3 alkly, and the aqueous solution of condensate polymer of step (b) in a mole ratio of dialkylamine to the equivalent molecular weight of the repeating unit of the condensation polymer of from about 20/1 to about 2/1,

d. admixing the mixture of step (c) with difunctional epoxide, the mole ratio of difunctional epoxide to dialkylamine being from about 2/1 to about 1/1,

e. reacting the resulting admixture at a temperature of from about 50° C. to about 80° C., said reaction being continued until the viscosity of the resultant cationic polymer is in the range of from about 40 centipoises to about 250 centipoises, viscosity of the cationic polymer being measured in water as a 40% by weight solution at 25° C., and

f. terminating the reaction of step (e).

4,045,378

USE OF HYDROQUINONE IN POLYURETHANE FOAMS CONTAINING HALOGENATED PHOSPHATE POLYESTER ADDITIVES

Clifford J. Maxwell, Milford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 29, 1976, Ser. No. 727,727
Int. Cl.² C08G *18/04*
U.S. Cl. 260—2.5 AJ **20 Claims**

1. In a method of making polyurethane foam which has reduced combustibility characteristics wherein the polyurethane foam formulation contains a halogenated phosphate polyester additive having the formula

wherein

R is an aliphatic hydrocarbon having 1–8 atoms or an aromatic hydrocarbon radical having 6–14 carbon atoms,

X is a halogen selected from chlorine, bromine and a mixture thereof,

a is an integer of 0–4,

n is an integer of 2–6, and

each

R′ is a haloalkyl radical having 1–8 carbon atoms, the halogen in this radical being chlorine, bromine or a mixture thereof,

wherein the improvement comprises:

adding an effective amount of hydroquinone to inhibit scorching in said foam formulation.

4,045,379

PROCESS FOR PREPARATION OF MODIFIED ION-EXCHANGE RESIN

Arien Kwantes; Pieter A. Gautier, and Anthony L. Farragher, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed July 26, 1976, Ser. No. 708,522
Claims priority, application United Kingdom, Aug. 1, 1975, 32251/75
Int. Cl.² C08F *8/34*; C07C *37/00*
U.S. Cl. 260—2.2 R **2 Claims**

1. A substantially water-insoluble cation exchange resin having an exchange capacity of from 2.6 to 5.2 meq/g dry weight comprising a plurality of mercaptoamine sulfonic acid salt groups, wherein said salt groups are cyclic aromatic mercaptoamine sulfonic acid salt groups wherein the mercapto and the amino groups are bound directly to the aromatic nucleus thereof.

4,045,380

CELLULAR MATERIAL

Geoffrey Vincent Dallow Blunt; Newton John Hodges, and Robert James Pragnell, all of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 345,574, March 28, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 547,061

Claims priority, application United Kingdom, Apr. 6, 1972, 15940/72

Int. Cl.[2] C08J 9/06; C08L 9/00

U.S. Cl. 260—2.5 HA 10 Claims

1. A process for the production of a cellular material by vulcanizing a mixture containing between 9 and 50% by weight of a mixture of a rubber together with vulcanizing agents to form an ebonite with the rubber, between 20% and 70 by weight of a coal digested in pitch, tar or tar oil, between 10% and 40% of a particular filler and a chemical blowing agent, whereby an ebonite structure is formed, so that, during the vulcanization, the chemical blowing agent decomposes or reacts to produce a gas, the viscosity of the composition during the production of the gas increasng whereby at least 25% by volume of closed cells are retained in the composition wherein the digested coal has a penetration converted to a Ring and Ball softening point of 85° C, of between 10 and about 45.

4,045,381

ORGANOSILICONE POLYMERS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,838

Int. Cl.[2] C08J 9/00

U.S. Cl. 260—2.5 AH 26 Claims

1. A polysiloxane-polyoxyalkylene block copolymer having the average formula

$$[RSiO3/2]_t(R_2SiO)_w(R(R^1)SiO)_z[(C_nH_{2n}O)_pR^2]_v$$

wherein:

R represents a momovalent hydrocarbon radical having from 1 to 10 carbon atoms;

R^1 represents a cyano-substituted radical of the formula $-(O)_aR^3CN$ wherein R^3 is a bivalent alkylene radical having from 2 to 6 carbon atoms or a bivalent alkyleneoxyalkylene radical having from 4 to 12 carbon atoms, and a has a value of 0 or 1;

R^2 is a monovalent hydrocarbon radical having from 1 to 12 carbon atoms;

t has an average value of about 0.8 to about 4;

w has an average value of about 3 to about 100,

z has an average value of about 3 to about 20;

n has a value of from 2 to 4 provided that about 20 to about 65 weight percent of the oxyalkylene units of the polyoxyalkylene chain, $(C_nH_{2n}O)_p$, is constituted of oxyethylene units;

p has an average value such that the average molecular weight of the polyoxyalkylene chain is from about 800 to about 6000, and

v has an average value of about 2 to about 4.

12. A process for producing flexible polyurethane foam, which comprises reacting and foaming a reaction mixture comprising: (a) a polyether polyol reactant containing an average of at least two hydroxyl groups per molecule; (b) a polyisocyanate reactant containing at least two ixocyanato groups per molecule; (c) a blowing agent; (d) a catalyst comprising an amine; and (e) as the foam stabilizer, a polysiloxane-polyoxyalkylene block copolymer as defined in claim 1.

4,045,382

MOLDING MATERIALS BASED ON POLYVINYL CHLORIDE AND POLYPHENYLENE OXIDE

Hans-Eberhard Braese, Cologne; Siegfried Adelmann, Krefeld; Dietrich Hardt, Cologne; Dieter Margotte, Krefeld, and Hugo Vernaleken, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 7, 1975, Ser. No. 602,950

Claims priority, application Germany, Aug. 28, 1974, 2441157

Int. Cl.[2] C08L 27/06, 7/00

U.S. Cl. 260—4 R 16 Claims

1. A thermoplastic molding composition consisting of a blend of

a. 30–90% by weight of polyvinyl chloride or of copolymers of vinyl chloride with up to 30% by weight based on the weight of the copolymer of one or more other copolymerizable vinyl compounds, and

b. about 10–70% by weight of a polyphenylene oxide based on 2,6-dimethylphenol having a molecular weight, $\bar{M}_w$, of between about 40,000 and 100,000.

4,045,383

STABLE EMULSIONS AND IMPROVED TEMPERATURE MONITORING FILMS PREPARED THEREFROM

Arnold Koff, West Orange, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 221,408, Jan. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 885,353, Dec. 15, 1969, abandoned. This application Jan. 21, 1976, Ser. No. 651,010

Int. Cl.[2] C09K 3/34

U.S. Cl. 260—8 3 Claims

1. A device suitable for forming thermographic patterns consisting of a film having, as an integral part thereof, from about 25% to about 75% by weight on a dry weight basis of a cholesteric liquid crystal composition containing from about 0.2% to about 1.75% by weight based on the weight of the cholesteric liquid crystals of butylated hydroxytoluene and from about 75% to about 25% by weight on dry weight basis, of gelatin and wherein the cholesteric liquid crystals are homogeneously distributed throughout the film.

4,045,384

METHOD FOR FORMING AN AMIDE BOND BETWEEN A LATEX AND PROTEIN

Linneaus C. Dorman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 23, 1976, Ser. No. 708,232

Int. Cl.[2] C08L 89/00

U.S. Cl. 260—8 6 Claims

1. A method for coupling a carboxylated latex to a protein with an amide bond which comprises reacting the latex with a water soluble carbodiimide and a water solubilized N-hydroxy compound to form an active ester latex, removing unchanged reactants from the active ester latex and coupling the cleaned active ester latex with a protein.

4,045,385

FREE-FLOWING UREA RESIN COMPOSITIONS WITH SILANE OR SILOXANE ADDITIVE ADDED BEFORE HARDENING

Gerd Klein, Troisdorf-Eschmar, and Kurt Schmoll, St. Augustin, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Nov. 13, 1975, Ser. No. 631,565

Claims priority, application Germany, Dec. 3, 1974, 2456979

Int. Cl.[2] C08J 3/00; C08L 1/00; C08G 12/12

U.S. Cl. 260—15 21 Claims

1. In the manufacture of a urea-formaldehyde molding composition wherein:

A. a liquid urea-formaldehyde resin composition is formed by condensing a urea with a formaldehyde;
B. said resin is combined with a filler; and
C. to said filler containing urea-formaldehyde resin composition there is added a hardening accelerator to harden said composition to a solid urea-formaldehyde molding composition, the improvement for improving the free-flowing qualities of the resultant solid urea-formaldehyde molding composition when heated at elevated temperatures which comprises introducing into said liquid urea-formaldehyde resin prior to hardening:
A. a polyorganosiloxane having recurring units of the formula

$$X(R)_aSiO_{3-a/2}$$

wherein
X is alkyl, alkylene or a hydrocarbon radical having a functional group;
R is hydrogen, alkyl, alkoxy or aryl;
a is a value from 0 to 2; in an amount of 0.05 to 1.6 weight percent based on the weight of the urea in the resin
or
B. a silane of the formula

$$Y—A_n—Si(R'')_b(OR')_{3-b}$$

wherein
Y is a substituted or unsubstituted amino, carboxyl, glycidyl, mercapto or alkenyl group;
A is a bivalent straight or branched-chained alkylene radical which can contain oxygen in the chain;
R′ is an alkyl or hydroxyl alkyl radical;
R″ is a C_{1-4} alkly radical;
n is 0 or 1, and
b is 0, 1 or 2; or a hydrolysis product thereof in an amount of 0.8 to 3.0 weight percent based on the weight of urea in said resin.

4,045,386

ALKALI-TREATED BARK EXTENDED TANNIN-ALDEHYDE RESINOUS ADHESIVES

Seymour Hartman, Mahopac, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 574,036, May 2, 1975, abandoned. This application Nov. 19, 1975, Ser. No. 633,235
Int. Cl.² C08L *1/02*
U.S. Cl. 260—17.2 **11 Claims**

1. A tree-derived adhesive composition, which comprises the reaction product of an admixture of an alkali-bark pre-mix, tannin and aldehyde, said alkali-bark pre-mix being a mixture of finely divided bark particles, alkali, and water, said pre-mix being neutralized with acid to a pH in the range of approximately 5.5 to 7 pH prior to the addition of the tannin and aldehyde, said admixture of said alkali-bark pre-mix, tannin, and aldehyde occurring without an application of external heat.

4,045,387

HIGHLY ABSORBENT POLYMERIC COMPOSITIONS DERIVED FROM FLOUR

George F. Fanta, Peoria, and William M. Doane, Morton, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 26, 1976, Ser. No. 708,792
Int. Cl.² C08L *1/02*
U.S. Cl. 260—17.4 GC **10 Claims**

1. A method of preparing water-insoluble, aqueous fluid-absorbing compositions comprising the following steps:
a. graft polymerizing acrylontrile onto a starch-containing substrate to form a starch-containing substrate-polyacrylonitrile (SCS-PAN) graft copolymer, wherein said starch-containing substrate is selected from the group consisting of flours and meals, and wherein the weight ratio of said substrate to said acrylonitrile is in the range of 75:25 to 25:75;
b. saponifying the SCS-PAN graft copolymer from step (a) in an aqueous slurry with an alkali in amounts such that the molar ratio of alkali to the acrylonitrile repeating unit of said SCS-PAN graft copolymer is from about 0.1:1 to about 7:1 to form a water-soluble saponified graft copolymer (SCS-HPAN); and
c. drying said water-soluble SCS-HPAN from step (b) to a moisture level in the range of about 1 to 15% water by weight, whereby said SCS-HPAN is rendered water-insoluble.

4,045,388

RESIN COMPOSITION OF HYDROPHILIC PULLULAN, HYDROPHOBIC THERMOPLASTIC RESIN, AND PLASTICIZER

Hiroomi Matsunaga, Kobe; Kozo Tsuji, Ibaragi, and Teruo Saito, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., both of Okayama, Japan

Filed Feb. 25, 1975, Ser. No. 552,745
Claims priority, application Japan, Feb. 28, 1974, 49-24498; Feb. 28, 1974, 49-24499
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.² C08L *5/00*
U.S. Cl. 260—17.4 ST **4 Claims**

1. A resin composition prepared by blending
a hydrophilic pullulan resin having a molecular weight of 10,000 to 5,000,000 selected from the group consisting of pullulan and a pullulan resin which has been partly modified by etherification, esterification or graftcopolymerization with a vinyl compound,
a hydrophobic thermoplastic resin selected from the group consisting of polyethylene, polypropylene, polystyrene, acrylonitrile-butadiene-styrene copolymers, polymethylmethacrylate, polyvinyl acetate, polyvinyl chloride, polyvinylidene chloride, vinyl acetate-vinyl chloride copolymer, ethylene-vinyl acetate copolymer, propylene-vinyl acetate copolymer, polycarbonates, polyacetals, polysulfones, polyamides, and polyesters, present in an amount of 2 to 98 wt % based on the total resin and
a plasticizer selected from the group consisting of water, glycerin, ethylene glycol, propylene glycol, butylene glycol, dimethyl sulfoxide, and dimethyl formamide present in an amount of 1 to 50 wt % based on the total weight of pullulan and plasticizer.

4,045,389

METHOD OF ADHERING TEXTILES WITH A POLYAMIDE MELT ADHESIVE

Manfred Drawert, Froendenberg-Strickherdicke; Eugen Griebsch, Nordkirchen, and Wolfgang Imoehl, Unna, all of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed July 27, 1976, Ser. No. 709,116
Claims priority, application Germany, July 31, 1975, 2534121; Apr. 10, 1976, 2615765; Apr. 10, 1976, 2615766
Int. Cl.² C09J *3/16*
U.S. Cl. 260—18 N **6 Claims**

1. In the method of adhering textiles with a melt adhesive, the improvement wherein said melt adhesive is a polyamide melt adhesive having a melt viscosity, measured at 200° C, of 25–600 Pas and which is the reaction product of approximately equivalent amounts of an acid component and a basic component, said acid component comprising
a. 1. a dimerized fatty acid having a content of 70–100 percent by weight of dimeric fatty acid and, optionally,
2. a monocarboxylic acid, as a molecular weight regulator, whereby up to 50 equivalent percent of the total carboxy

groups of the mixture (a) (1) and (2) can be derived from the monocarboxylic acid, and

b. one or more aliphatic straight chain co-dicarboxylic acids having 6–13 carbon atoms, wherein the ratio of carboxylic acids according to (a) (1) and (2) to carboxylic acid according to (b) is from 0.05:1 to 5:1, calculated on the carboxy groups, said basic component comprising

c an aliphatic straight chain diprimary diamine having 6–12 carbon atoms and

d. caprolactam, ϵ-aminocaproic acid, or mixtures thereof such that from 0.5 to 1.5 mols of caprolactam, ϵ-aminocaproic acid, or mixtures thereof are reacted per mol of carboxyl groups in said acid component.

4,045,390

SILICONE RUBBER COMPOSITIONS

Kunio Itoh, and Takeshi Fukuda, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Dec. 23, 1975, Ser. No. 643,795
Claims priority, application Japan, Dec. 28, 1974, 50-3994
Int. Cl.² C08L *91/00*
U.S. Cl. 260—18 S **8 Claims**

1. An organopolysiloxane composition comprising (a) 100 parts by weight of a linear diorganopolysiloxane with a polymerization degree higher than 3,000 terminated at both chain ends with hydroxy groups directly bonded to the silicon atoms and composed of alternately linked portions of two kinds of blocks, (i) one of which is a vinyl-containing diorganopolysiloxane block composed of randomly linked methylvinylsiloxane units (CH_3) (CH_2=CH)SiO and diorganosiloxane units R_2SiO, where R is the same or different substituted or unsubstituted monovalent hydrocarbon group having no aliphatic unsaturation, the total number of said methylvinylsiloxane units and said diorganosiloxane units being from 10 to 400 and the number of said methylvinylsiloxane units in each of the vinyl-containing blocks being at least 3, and (ii) the other of which is a vinyl-free diorganopolysiloxane block composed of at least 400 of diorganosiloxane units $R_2'SiO$ where R' has the same meaning as R above, (b) from about 20 to about 200 parts by weight of a silica filler with a specific surface area at least 150 m^2/g, (c) an organohydrogenpolysiloxane having at least two hydrogen atoms directly bonded to the silicon atoms in a molecule in an amount such that the total number of the hydrogen atoms directly bonded to the silicon atoms is equal to from about 40% to about 400% of the total number of the vinyl groups in the said component (a) defined above, and (d) a catalytic amount of platinum or a platinum compound.

4,045,391

PROCESS FOR PREPARING LOW VISCOSITY FATTY ACID-MODIFIED POLYESTERS

Adolf Buschfeld, Alpen, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Feb. 17, 1976, Ser. No. 658,545
Claims priority, application Germany, Feb. 25, 1975, 2507985
Int. Cl.² C09D *3/64*
U.S. Cl. 260—22 EP **20 Claims**

1. A multi-stage process for preparing low viscosity, fatty acid-modified polyesters for use in varnish systems of low solvent content which comprises the following stages conducted in sequential order at elevated temperatures:

a. reacting a monocarboxylic acid glycide ester with a compound selected from the group consisting of a polycarboxylic acid and an ester polycarboxylic acid to form a polyhydric ester alcohol,

b. reacting the said polyhydric ester alcohol with a polycarboxylic acid anhydride to form an ester polycarboxylic acid,

c. reacting the said ester polycarboxylic acid formed in (b) with a material selected from the group consisting of an alkylene oxide, an epoxyalkanol and a polyhydric alcohol to form the fatty-acid modified polyester product.

4,045,392

ALKYD RESIN MANUFACTURING PROCESS BY USING WATER OR STEAM TO REVERSE OR RETARD GELATION

William B. Callahan, Merion, Pa., and B. Frank Coe, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1975, Ser. No. 557,407
Int. Cl.² C08G *63/22*; C09D *3/64*
U.S. Cl. 260—22 R **8 Claims**

1. In a process for the manufacture of liquid alkyd resins which comprises esterifying a polybasic acid with a polyhydric alcohol under reaction temperature conditions and removing water as formed in the process; in the event gelation of the alkyd resin occurs in the process, the improvement in combination therewith which comprises the addition of sufficient steam at a rate of at least 0.02% by weight, based on the weight of the alkyd resin, per minute until a gel free composition is formed to reverse the gelation of the alkyd resin while maintaing the alkyd resin at reaction temperature conditions of about 200°–275° C.

4,045,393

RUST RESISTANT LATEX PAINT PRIMER FOR METAL SURFACES

Paul Krevenas, Philadelphia, Pa., and David Graeme Milne, Miami, Fla., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 540,873, Jan. 14, 1975, abandoned. This application Dec. 24, 1975, Ser. No. 644,312
Int. Cl.² C08L *91/00*
U.S. Cl. 260—23 R **6 Claims**

1. In a latex paint primer containing a polyacrylic, polystyrene-acrylic or polyvinyl acetate latex emulsion, said polymeric latex emulsion containing from 45 to 60% solids, the amount of said latex emulsion employed in said latex paint being from 20 to 30%, the improvement comprising having present in said latex paint primer from 5 to 10% of a natural drying oil selected from the group consisting of tung, linseed, safflower, soya bean, peanut and tall oil and from 5 to 15% a basic zinc phosphite having the formula $xZnO.ZnHPO_3$ where x is a number from $\frac{1}{2}$ to 10, thereby forming a paint primer which when used on a metal surface prevents flash rusting, all of the percentages expressed on a weight basis.

4,045,394

VISCOSITY STABILIZATION OF VICINAL ACRYLOXY HYDROXYL DERIVATIVES OF LINSEED OIL WITH N-ALKYLMORPHOLINES

Lawrence George Hess, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 9, 1976, Ser. No. 694,202
Int. Cl.² C08F *2/46*
U.S. Cl. 260—23 AR **4 Claims**

1. A composition comprising a vicinal acryloxy hydroxyl derivative of linseed oil and an amount sufficient to stabilize said composition against viscosity increases of an N-alkylmorpholine, wherein the alkyl unit contains from 1 to 4 carbon atoms.

4,045,395

ADHESIVE COMPOSITION

Ray I. Roby, Medford, Oreg., assignor to Roby's Enterprises, Inc., Medford, Oreg.

Filed Mar. 1, 1976, Ser. No. 662,736
Int. Cl.² C08L *91/00*
U.S. Cl. 260—28.5 AS **4 Claims**

1. A water-resistant adhesive composition which is essentially a mixture of an aqueous coal tar emulsion having a nonvolatile content by chemical analysis and an aqueous polyvinly acetate emulsion having a solids content by chemical analysis, the ratio of the coal tar nonvolatiles to polyvinyl acetate solids

in said mixture ranging from about 0.3 to 2.5:1, and sufficient water to produce a ratio of water to combined coal tar nonvolatiles and polyvinyl acetate solids in said composition within the range of about 2 to 4:1.

4,045,396

FLAME RETARDANT PERMANENT PRESS

Nelson Samuel Marans, and Alfred Gluecksmann, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 619,537, Oct. 3, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 733,983

Int. Cl.[2] C08K *3/00;* **C08G** *18/84;* **B32B** *27/40;* **D06M** *15/12*

U.S. Cl. 260—29.2 TN **3 Claims**

1. A composition designed to impart simultaneously wrinkle resistance and flame retardant properties to cellulosic textile materials which comprises the products obtained by reacting (A) a polyoxyalkylene polyol with (B) an aryl or alkyl diisocyanate to obtain a polyoxyalkylene capped diisocyanate which is then reacted with (C) a ketone solution of an alkyleneamine selected from diethylene triamine and triethylene tetramine to obtain a polyamine product, removing the ketone and further reacting the polyamine product with (D) a phosphorous compound selected from phosphorous acid and phosphorous trichloride, and (E) aqueous aldehyde containing 1 to 6 carbon atoms to obtain a phosphoalkylated amine-containing product, the mole ratio of components (A) to (B) to (C) being in the range of 1.0 of (A) to 1.5–2.5 of (B) to 1.5–4.0 of (C) and the mole ratio of (E) to (C) to (D) being in the range of 4.5–10.0 of (E) to 1.0 of (C) to 4.5–7.0 of (D) when (C) is diethylene triamine and 6.5–10.0 of (E) to 1.0 of (C) to 6.5–9.0 of (D) when (C) is triethylene tetramine.

4,045,397

PRINTING INK COMPOSITIONS FOR JET PRINTING ON GLAZED CERAMIC SURFACES

Dean Burton Parkinson, 450 W. Oakwood Blvd., Redwood City, Calif. 94061

Continuation-in-part of Ser. No. 571,215, April 24, 1975, abandoned. This application June 27, 1975, Ser. No. 590,802

Int. Cl.[2] C08L *61/10;* **C10M** *3/04*

U.S. Cl. 260—29.3 **14 Claims**

1. An ink composition in which the binder component consists essentially of a soluble, linear, low molecular weight novolac resin, and in which the diluent consists essentially of a low boiling alcohol or alcohol and water in which the amount of water does not exceed 50% and which includes a water and alcohol soluble dyestuff, an organo silicon compound in the form of a silane or its hydrolysis product in which the silane has the general formula R_nSiX_{4-n} in which X is a highly hydrolyzable group, n is a number of from 1 to 3, R is an organic group in which at least one of the groups is an organic group containing a highly functional group.

4,045,398

RESOLE RESIN BINDER COMPOSITION

Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 24, 1975, Ser. No. 634,572

Int. Cl.[2] C08L *61/10;* **C08G** *8/10*

U.S. Cl. 260—29.3 **10 Claims**

1. A non-corrosive binder composition comprising a low molecular weight resole resin and a boron compound curing accelerator, selected from the group consisting of boric acid, diammonium tetraborate, diammonium octaborate, diammonium pentaborate and mixtures thereof, said boron compound being present in from about 1 to 30 parts by weight per 100 parts of resole resin solids, said composition having a pH of about 7–10 by the addition of sufficient ammonium hydroxide to raise the pH to about 7–10 and said resole resin having a viscosity of 5 to 5000 cps.

4,045,399

CURABLE AQUEOUS COATING COMPOSITION

Hiroo Suzuki, and Isao Takada, both of Tokyo, Japan, assignors to Toyo Ink Mfg. Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1976, Ser. No. 653,867

Int. Cl.[2] C08L *33/02*

U.S. Cl. 260—29.6 N **6 Claims**

1. A curable aqueous coating composition comprising dicyandiamide and/or a water soluble salt of guanidine dissolved in an aqueous solution of a water soluble salt of a copolymer comprising about 5 to about 30 wt% of one or more unsaturated carboxylic acid monomers, about 10 to about 50 wt% of one or more hydroxyalkyl (alkyl carbons: 2-8) acrylate or methacrylate monomers and about 20 to about 85 wt% of one or more (C_1-C_{18}) alkyl acrylate monomers, where the amount of the dicyandiamide and/or the water soluble salt of guanidine is about 0.1 to about 1.0 mol equivalent per 1 mol of hydroxyl group containing monomers in the copolymer.

4,045,400

ANTIFRICTION SELF-LUBRICATING MATERIAL

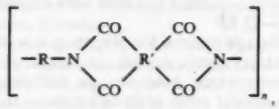
Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Irina Alexandrovna Gribova, ulitsa Vavilova, 12, kv. 31; Martin Izrailevich Kabachnik, ulitsa Gubkina, 4, kv. 11; Alexandr Petrovich Krasnov, prospekt Kalinina, 31, kv. 28; Alla Nikolaevna Chumaevskaya, ulitsa Novatorov, 40, kv. 24; Olga Vladimirovna Vinogradova, 5 Parkovaya ulitsa, 56, korpus 6, kv. 35; Svetlana Vasilievna Vinogradova, ulitsa Miklukho-Maklaya, 30, korpus 2, kv. 63; Evgenia Semenovna Krongauz, Leningradsky prospekt, 26, kv. 60; Alla Markovna Berlin, ulitsa Obrucheva, 3, korpus 4, kv. 67, all of Moscow; Alexandr Vasilievich Vinogradov, prospekt RKKA, 180, kv. 56, Zagorsk Moskovskoi oblasti; Galina Ilinichna Gureeva, ulitsa Molostovykh, 11, korpus 5, kv. 18, Moscow; Leonid Sergeevich Zakharov, B.Bronnaya ulitsa, 20, kv. 17, Moscow; Vladimir Dmitrievich Vorobiev, Novocheremushkinskaya ulitsa, 43/30, kv. 152, Moscow; Irina Sergeevna Mazaeva, Beskudnikovsky bulvar, 2, korpus 2, kv. 73, Moscow; Georgy Viktorovich Mamatsashvili, Ierusalimskaya ulitsa, 6, kv. 119, Moscow; Nikolai Sergeevich Zabelnikov, Zheleznodorozhnaya ulitsa, 26a, kv. 102, Krasnogorsk Moskovskoi oblasti, and Natalia Monovna Kofman, Sevastopolsky prospekt, 31, korpus 2, kv. 45, Moscow, all of U.S.S.R.

Filed May 14, 1975, Ser. No. 577,792

Int. Cl.[2] C08K *3/30, 9/02*

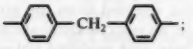
U.S. Cl. 260—37 N **8 Claims**

1. An antifriction self-lubricating material comprising a press-molded mixture of a nitrogen-containing polymer selected from the group consisting of fusible polyimides of the formula:



where

R is selected from the group consisting of



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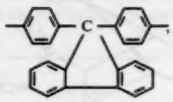
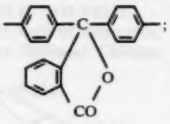
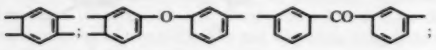
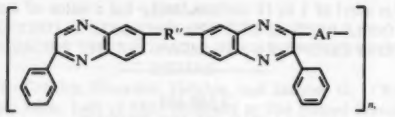




R′ is selected from the group consisting of



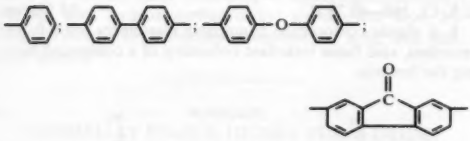
n = from 20 to 400,
and polyphenylquinoxalines of the formula



where

R″ is selected from the group consisting of —O—, —SO_2—, —CO— or is absent;

Ar is selected from the group consisting of



n = from 50 to 300, taken in a quantity of from 5 to 95 percent by weight of the antifriction material, and a filler comprising molybdenum disulphide modified with phosphorus-containing compounds selected from the group consisting of phosphorus-containing acids and phosphorus-containing esters, the phosphorus content in the modified molybdenum disulphide being from 0.01 to 2 percent by weight, and the content of the modified molybdenum disulphide in the antifriction material being within the range from 5 to 95 percent by weight.

4,045,401

MIXING APPARATUS AND METHOD

Donald G. Stenmark, Houston, and Raymond L. Heinrich, Baytown, both of Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 324,458, Jan. 17, 1973, Pat. No. 3,884,451. This application Nov. 11, 1974, Ser. No. 522,563
Int. Cl.² B29B *1/06*; C08K *7/14*
U.S. Cl. 260—42.18 **9 Claims**

1. A method of mixing a polyolefin and an additive which comprises introducing them into a single screw extruder having a rotatable core means comprising in combination:

a. an extruder screw means having a succession of individual spaced apart, offset, discontinuous, helical flights disposed on said screw means to form channels between said flights;

b. each successive flight being centered in a channel of preceding flights;

c. said flights having the narrowest-width-channel within the range from about —0.25 to about three diameters of said core means, the diameter of said core means including said flights;

whereby said polyolefin and said additive form a flowing first stream within said extruder, having a helical and longitudinal motion relative to the helical axis of the first stream, said first stream is subsequently split into at least second, third, fourth and fifth flowing streams, said second and third streams being subsequently combined with said fourth and fifth streams, successively repeating the said forming, splitting and combining steps to generate a number of mixed streams which increases exponentially with the length of said longitudinal motion, and recovering mixed polyolefin and additive from said extruder.

4,045,402

FLUOROELASTOMER-POLYACRYLATE BASED FRICTION MATERIAL

Roger O. Bjerk, Edelstein; William D. Brandon; Frederick S. Engelking, both of Peoria, and John P. Jero, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 366,967, June 4, 1973, Pat. No. 3,898,361. This application Aug. 1, 1975, Ser. No. 601,398
Int. Cl.² C08K *9/10, 9/12*
U.S. Cl. 260—42.18 **5 Claims**

1. As an article of manufacture a friction material formed of 20 to 60% by weight of a matrix comprising a fluoroelastomer intimately intermixed with a polyacrylate elastomer in a weight ratio of fluoroelastomer to polyacrylate which falls within the range from about 11:1 to about 1:11, at least 5% by weight of said 20 to 60% by weight total matrix being said fluoroelastomer, from about 12 to about 40% by weight of carbon black; and from about 20 to about 60% by weight of glassy or ceramic asperite particles of from about 0.0001 to about 0.005 inch in effective diameter intermixed with and dispersed throughout said friction material in mechanically held nonbonded relation to provide a friction surface of said article of manufacture including the said matrix and said ceramic particles.

4,045,403

METHOD OF COMPOUNDING THERMO-PLASTIC POLYMERIC MATERIALS AND FILLERS

Ray C. Lever, Fairfield, and Edward V. Wilkus, Trumbull, both of Conn., assignors to General Electric Company, New York, N.Y.

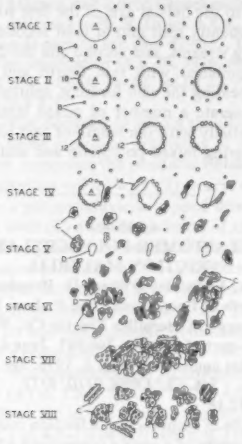
Division of Ser. No. 273,156, July 19, 1972, Pat. No. 3,997,494. This application July 29, 1974, Ser. No. 492,964
Int. Cl.² C08K *9/10, 9/12*
U.S. Cl. 260—42.42 **30 Claims**

1. The method of compounding thermoplastic polymeric material and filler, comprising the steps of:

a. mixing particles of thermoplastic polymeric material with particulate filler proportioned in amounts ranging from at least 5 to about 200 parts by weight of the filler per 100 parts by weight of the polymeric material while melting surface portions of the particles of polymeric material, whereby the filler is blended with the melting surface portions of said polymeric particles and the resultant blend of the melted polymeric material and filler is removed from the remaining portion of the polymeric particles by the mixing action; and,

b. continuing both the mixing of the particles of thermoplastic polymeric material with the filler and the melting of surface portions of said particles with the resulting blending of the melting surface portions and filler and the removal of the resultant blend of melted polymeric material and filler from said particles of polymeric material to effect a progressive melting and diminution of the said

particles of polymeric material until greater than 50% of the particulate polymeric material has become expended by melting and a majority of greater than 50% of the filler has become substantially assimilated into the polymeric material whereby said polymeric material and filler are



substantially compounded to a free flowing particulate form comprising discrete particles of the compounded blend of polyeric material and filler with said blend comprising fundamental units predominantly structured essentially of a stratified layer of filler adhesively embraced by a film-like mass of polymeric material.

4,045,404

HINDERED PHENOLIC NORBORNANE-2,3-DICARBOXIMIDES AND STABILIZED COMPOSITIONS

John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 429,234, Dec. 28, 1973, Pat. No. 3,896,147. This application May 8, 1975, Ser. No. 575,670

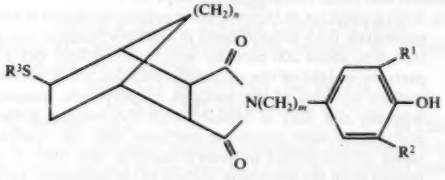
Int. Cl.[2] C08K *5/00;* **C08L** *4/00*

U.S. Cl. 260—45.8 N **6 Claims**

1. A composition of matter comprising an organic material normally subject to oxidative, thermal and/or ultraviolet light degredation and

a. from 0.01 to 5% of a stabilizer having the formula

I



wherein

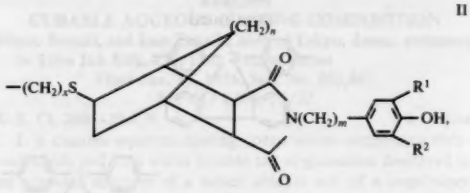
R^1 and R^2 are the same or different (lower) alkyl groups of 1 to 4 carbon atoms,

m has a value of 0 to 3,

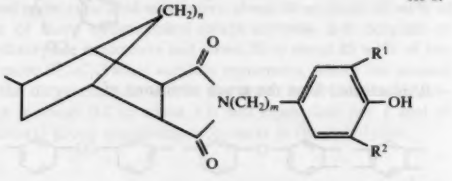
n has a value of 1 and 2, and

R^3 is alkyl group of 1 to 18 carbons, a group of the formulae

II



III or



IV

$-(CH_2)_p-CO_2R^4$

where

x has a value of 2 to 18,

R^4 is alkyl of 1 to 18 carbons, and *p* has a value of 1 or 2,

b. from 0 to 5% of a UV absorber, and

c. from 0 to 5% of a co-stabilizer.

4,045,405

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

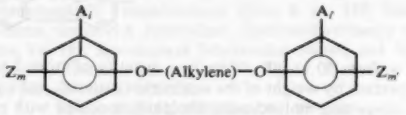
Filed Feb. 8, 1973, Ser. No. 330,850

The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.

Int. Cl.[2] C08L *9/00*

U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising elastomers and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,045,406

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

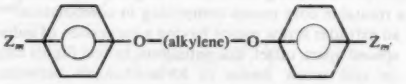
Filed Feb. 8, 1973, Ser. No. 330,840

The portion of the term of this patent subsequent to July 5, 1994, has been disclaimed.

Int. Cl.[2] C08L *77/06*

U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising a nylon and a flame retardant said flame retardant consisting of a compound having the formula



wherein (a) Z is bromine; (b) m and m' are independent and are integers having a value of from 1 to 5; and (c) alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

4,045,407

PROCESS FOR PREPARING AMIDEIMIDE POLYMERS IN THE PRESENCE OF ALCOHOLIC SOLVENT

Robert G. Keske, and James R. Stephens, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,715
Int. Cl.[2] C08G *73/14*
U.S. Cl. 260—47 CP **13 Claims**

1. The process of producing an amideimide polymer without using an acid having an acyl halide group, which comprises reacting a composition comprising an aromatic diprimary amine and a tricarboxylic acid compound selected from the group consisting of trimellitic acid and trimellitic anhydride in an alcoholic solvent containing a tertiary amine wherein said alcoholic solvent comprises an alkanol containing from 4 to 10 carbon atoms.

4,045,408

FLUORO-ANHYDRIDE CURING AGENTS AND PRECURSORS THEREOF FOR FLUORINATED EPOXY RESINS

James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 19, 1976, Ser. No. 668,555
Int. Cl.[2] C08G *59/42*
U.S. Cl. 260—47 EA **10 Claims**

1. A precursor of a curing agent for fluorinated epoxy resins selected from the class consisting of hydroxyperfluoroalkyl phthalic acid, hydroxyperfluoroalkyl pyromellitic acid, hydroxyperfluoroalkyl benzenepentacarboxylic acid, and mixtures thereof.

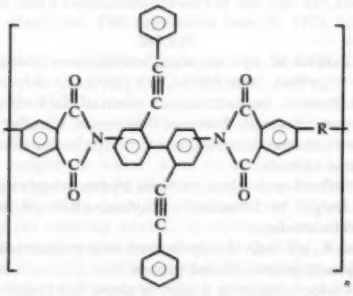
4,045,409

THERMALLY STABLE, HIGHLY FUSED IMIDE COMPOSITIONS

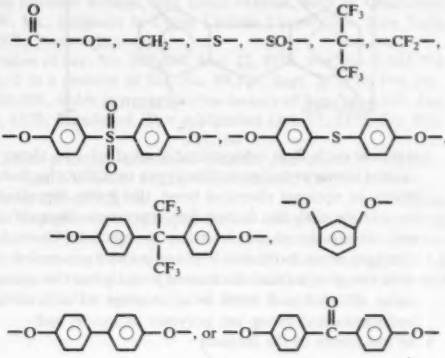
Fred E. Arnold, Centerville, and Frederick L. Hedberg, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,324
Int. Cl.[2] C08G *73/10, 73/12*
U.S. Cl. 260—49 **12 Claims**

1. A thermally stable imide polymer consisting essentially of repeating units having the following formula:



wherein the imido nitrogen atoms are connected to the 4,4' or the 5,5' positions of the biphenyl linkage containing the 2,2'-phenylethynyl groups, and wherein R is



and *n* has a value such that the polymer has an inherent viscosity of about 0.1 to 2.0 as measured in N,N'-dimethylacetamide at 30° C.

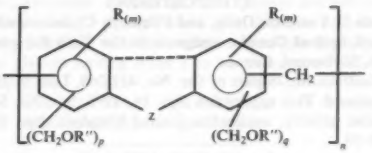
4,045,410

CARBOXYLATED DIPHENYLETHER-FORMALDEHYDE COPOLYMER RESINS AND THEIR PREPARATION

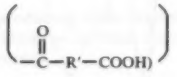
Raymond A. Plepys, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1975, Ser. No. 623,511
Int. Cl.[2] C08G *16/04*
U.S. Cl. 260—52 **13 Claims**

1. A copolymer resin having the repeating unit



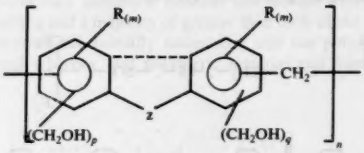
wherein each R is independently an alkyl group of 1 to about 10 carbon atoms or a halogen, *z* is oxygen or sulfur, the dashed line is an optional chemical bond, the group represented by *z* taken with the dashed line represents dibenzofuran and dibenzothiophene moieties, or mixtures thereof, each R'' is hydrogen or



wherein each R' is a substituted or unsubstituted alkylene or arylene radical of 2 to about 11 carbon atoms, *n* averages about 3–10, each *m* is 0–2, and *p* and *q* are each 0 or 1 with the proviso that the sum of *p* and *q* has an average value of 0.1–1 and there is an average of at least one carboxyl group per polymer molecule.

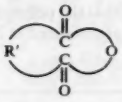
10. A process for preparing the copolymer resin having the repeating unit of claim **1** comprising heating with agitation a mixture comprising

a. a hydroxymethyl substituted diphenylether-formaldehyde copolymer resin having the repeating unit



wherein each R is independently alkyl of 1 to about 10 carbon atoms or halogen, *z* is oxygen or sulfur, the dashed line is an optional chemical bond, the group represented by *z* taken with the dashed line represents dibenzofuran and dibenzothiophene moieties, or mixtures thereof, *n* averages about 3–10, *m* is 0–2, and *p* and *q* are each 0 or 1 with the proviso that the sum of *p* and *q* has the average value of 0.1–1 and there is an average of at least one hydroxymethyl group per polymer molecule, and

b. an anhydride of the formula



wherein R′ is a substituted or unsubstituted alkylene or arylene radical of from 2 to about 11 carbon atoms,

to a temperature between about 120° C and about 170° C for about 10 to about 50 minutes wherein the ratio of (*b*) to (*a*) is between about 0.1 to about 1.1 mole of (*b*) per equivalent hydroxyl group in (*a*).

4,045,411

MOBILE ROOM-TEMPERATURE STABLE ACID CATALYZED PHENOL FORMALDEHYDE RESIN COMPOSITIONS

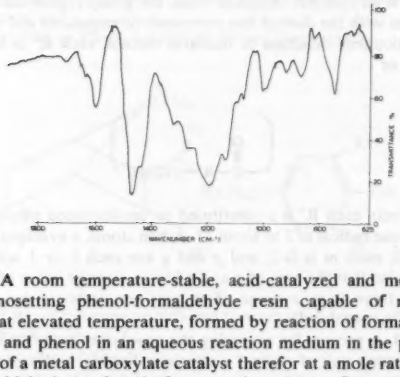
Ramesh C. Vasishth, Delta, and Pitchaiya Chandramouli, Richmond, both of Canada, assignors to Cor Tech Research Limited, Richmond, Canada

Continuation-in-part of Ser. No. 421,068, Dec. 9, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,864

Claims priority, application United Kingdom, Apr. 17, 1974, 16860/74

Int. Cl.[2] **C08G** *2/28, 2/30*

U.S. Cl. 260—59 R **5 Claims**



1. A room temperature-stable, acid-catalyzed and mobile thermosetting phenol-formaldehyde resin capable of rapid cure at elevated temperature, formed by reaction of formaldehyde and phenol in an aqueous reaction medium in the presence of a metal carboxylate catalyst therefor at a mole ratio of formaldehyde to phenol of greater than about 1.7:1 and acid catalysis of the resin so formed, and having a viscosity of about 1000 to 40,000 cps at 75° F.

4,045,412

ALUMINA SUBSTRATE AND METHOD OF MANUFACTURING SAME

Seiichi Yamada, Machida, and Kyohei Murakawa, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed July 14, 1975, Ser. No. 595,703

Claims priority, application Japan, July 16, 1974, 49-81296

Int. Cl.[2] **C04B** *35/64, 35/10*

U.S. Cl. 264—63 **13 Claims**

1. A method of manufacturing an alumina substrate having a surface finish of no more than 0.05 μm center line average on at least one major surface and a density of at least 3.90 g/cm^3 in an as-fired condition, comprising the steps of:

making an aggregated raw material powder by dry milling a mixture consisting of fine alumina particles, having high purity, and a grain growth inhibitor of 0.1 to 0.5 wt%;

producing a slip consisting of said aggregated raw material powder and an organic agent comprising a binder and a solvent; said solvent is provided to ensure that said raw material powder is uniformly dispersed in said slip;

forming a solvent-free green sheet from said slip, having a high content of said raw material powder and a density of more than 2.60g/cm^3, said step of forming including the step of subjecting said slip to a vacuum to eliminate bubbles and evaporate said solvent from said slip, followed by the step of shaping said solvent-free slip into a sheet and the further step of drying said sheet at room temperature; and firing said green sheet at a temperature in the range of 1525° C to 1650° C until said alumina particles in said fired sheet grow sufficiently to form straight boundaries and flat surfaces corresponding to said major surface of said alumina substrate.

4,045,413

POSSIBLE ACTIVE MATRIX POLYMERS

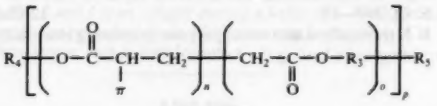
Richard W. Radler, Jr., Marion, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 401,468, Sept. 27, 1973, Pat. No. 3,884,690. This application Oct. 21, 1974, Ser. No. 516,066

Int. Cl.[2] **C08G** *63/18, 63/68*

U.S. Cl. 260—63 R **20 Claims**

1. A polyester material of the formula



wherein

π is defined as pyrene, tetraphenylpyrene, phenylpyrene, acetylpyrene, benzpyrene, alkylpyrene, chrysene, benzochrysene, benzathracene, dibenzathracene, perylene, picene, tetracene, fluorene, fluorenone, nitrofluoroenone, phenanthrene, anthraquinone, thiophene or dibenzothiophene radicals;

R_3 is defined as divalent aromatic hydrocarbon radical or as a straight or branched methylene chain of from 1–20 carbon atoms;

R_4 and R_5 are individually defined as low molecular weight aliphatic polymeric end groups;

n and *o* are integers in a ratio of about 1–3:1; and

p is an integer commensurate with a number average molecular weight of about 5,000 – 100,000.

4,045,414

DI-SUBSTITUTED META-TERPHENYL COMPOUNDS AND RESULTING POLYMERS

Guy Rabilloud, and Bernard Sillion, both of Grenoble, France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

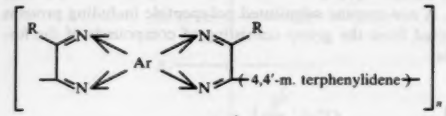
Division of Ser. No. 533,822, Dec. 18, 1974. This application Dec. 23, 1975, Ser. No. 643,837

Claims priority, application France, Dec. 19, 1973, 73.45637

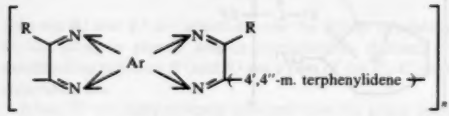
Int. Cl.[2] C08G *73/06*

U.S. Cl. 260—65 7 Claims

1. A heterocyclic thermostable polymer comprising recurring units of at least one of the types represented by the general formulae



and



wherein Ar is a tetravalent aromatic radical which comprises one or more aromatic rings, and the four valences of which are located, by pairs, on adjacent carbon atoms of the same ring, R is a hydrogen atom, an alkyl radical or an aryl radical, and the arrows indicate a possible isomerism.

4,045,415

PROCESS FOR PREPARING COPOLYMERS OF TRIOXANE

Günter Sextro, Naurod; Karlheinz Burg, Langenhain, Taunus; Klemens Gütweiler, Oberjosbach, and Klaus Dürichen, Munich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

Continuation-in-part of Ser. No. 427,251, Dec. 21, 1973, abandoned, and a continuation-in-part of Ser. No. 427,254, Dec. 21, 1973, abandoned. This application June 18, 1975, Ser. No. 587,839

Claims priority, application Germany, Dec. 14, 1973, 2362172

Int. Cl.[2] C08G *2/10;* C08F *6/00, 3/00*

U.S. Cl. 260—67 FP 10 Claims

1. In a process for producing copolymers of trioxane by copolymerization of 99.9 to 90 weight percent of trioxane and 0.1 to 10 weight percent of a cyclic acetal, which process includes the steps of mixing said trioxane and cyclic acetal with a cationically active catalyst at a temperature of 62° to 115° C., solidifying the resulting mixture by chilling it and thereafter heating the resulting mixture to about 62° to 130° C. while it is maintained in a solid state to substantially complete said polymerization, the improvement which consists in chilling the liquid mixture of trioxane and acetal immediately after it is mixed and prior to the development of turbidity therein.

4,045,416

AMINE ACRYLATE ADDITION REACTION PRODUCT COMPOSITIONS

John Howard Robson, and Erich Marcus, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

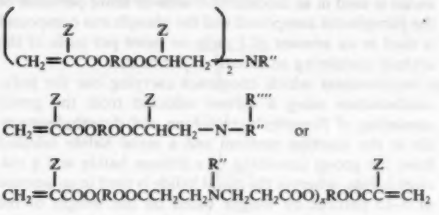
Division of Ser. No. 499,636, Aug. 22, 1974, Pat. No. 3,963,771, which is a division of Ser. No. 69,136, Sept. 2, 1970, Pat. No. 3,845,056, which is a continuation-in-part of Ser. No. 6,939, Jan. 29, 1970, abandoned. This application Oct. 17, 1975, Ser. No. 623,360

Claims priority, application Canada, Jan. 21, 1971, 103255

Int. Cl.[2] C08F *18/24;* C07C *101/20;* C07D *51/70*

U.S. Cl. 260—77.5 CR 7 Claims

1. A pigmented or unpigmented composition comprising from 1 to 99.9 weight percent of at least one amine acrylate, said amine acrylate being the addition reaction product of a primary or secondary organic amine and a polyacrylate, said reaction product being selected from the group of:



wherein

Z is hydrogen or methyl

R'' is alkyl of from 1 to 5 carbon atoms, cycloalkyl of from 5 to 10 carbon atoms, or aryl or aralkyl or alkaryl of from 6 to 12 carbon atoms;

R'''' is hydrogen or alkyl of from 1 to 5 carbon atoms; and

R is the residue of a diol of the group of saturated aliphatic diols having from 2 to 20 carbon atoms, bicyclo[2.2.1]-hept-2-ene diols, cyclohexyl diols, phenyl and mono-and di- lower alkyl phenyl diols, polyalkylene ether diols having from 2 to 4 carbon atoms in the alkylene group and ester glycols having from 1 to an average of 17.5 ester groups; and

x has a value of from 1 to 4; in admixture with at least one other radiation curable composition.

4,045,417

PRODUCTION OF AROMATIC POLYAMIDES

Noboru Yamazaki, and Fukuji Higashi, both of Tokyo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sept. 2, 1975, Ser. No. 609,740

Claims priority, application Japan, Sept. 9, 1974, 49-104247

Int. Cl.[2] C08G *69/12, 69/32*

U.S. Cl. 260—78 A 8 Claims

1. In a process for producing a fiber forming aromatic polyamide by polycondensing an arylene containing aminocarboxylic acid of the formula,

$$H_2N - R^1 - COOH$$

wherein R^1 is an aromatic hydrocarbon radical or two or more aromatic hydrocarbon radicals bonded through an alkylene group having 1 to 4 carbon atoms, an alkylidene group having 2 to 4 carbon atoms, —O—, —S—, —SO_2—, —CO—, —NH—, —NR′— wherein R′ is an alkyl group having 1 to 4 carbon atoms, —CONH—,

$$-SO_2NH-, \quad -\overset{\overset{O}{\|}}{C}-O-, \quad \text{or} \quad -O-\overset{\overset{O}{\|}}{C}-O-,$$

or said radical or radicals having one or more substituents on the aromatic nuclei, said substituent being an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a halogen atom, a nitro group or a cyano group,

in the presence of a phosphorus compound of the formula,

$$R^4 - P(OR^5)_2$$

wherein R^4 is OR^5, a hydroxyl group, an alkyl group having 1 to 6 carbon atoms or an aryl group with or without at least one substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a halogen atom, a nitro group and a cyano group; and R^5 is an aryl group with or without at least one substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a nitro group and a cyano group,

and a tertiary amine in the liquid phase, wherein the tertiary amine is used in an amount of 1 mole or more per mole of the phosphorus compound and the phosphorus compound is used in an amount of 1 mole or more per mole of the arylene containing aminocarboxylic acid,

the improvement which comprises carrying out the polycondensation using a solvent selected from the group consisting of N-methylpyrrolidone and dimethylacetamide as the reaction medium and a metal halide selected from the group consisting of a lithium halide and a calcium halide, wherein the metal halide is used in an amount of 1–15 percent by weight based on the weight of the mixture of the tertiary amine and the solvent.

4,045,418

COPOLYMERS OF D,L-LACTIDE AND EPSILON CAPROLACTONE

Richard G. Sinclair, Columbus, Ohio, assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1975, Ser. No. 544,789

The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.

Int. Cl.[2] C08G *63/08, 63/10*

U.S. Cl. 260—78.3 R **12 Claims**

1. A thermally stable copolymer of an optically inactive lactide and epsilon caprolactone, said copolymer being obtained by heating a mixture of L,L-lactide having a melting point above 100° C. and epsilon caprolactone at a temperature above the melting point of D,L-lactide and below 200° C. in the presence of a catalyst, said mixture comprising about 60 to about 95 per cent by weight of D,L-lactide.

4,045,419

CHEMICAL PROCESS FOR PRODUCING ISOPRENE BY PYROLYSIS OF ALLYLIC ESTERS

Charles N. Winnick, Teaneck, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation of Ser. No. 318,942, Dec. 27, 1972, abandoned, which is a division of Ser. No. 638,659, May 15, 1967, abandoned, which is a continuation-in-part of Ser. No. 543,802, April 20, 1966, abandoned. This application Nov. 29, 1974, Ser. No. 528,103

Int. Cl.[2] C07C *1/00, 1/20, 5/42*

U.S. Cl. 260—681 **6 Claims**

1. A water tolerant process for the preparation of isoprene which comprises treating in the presence of a catalyst methylbutene with an aliphatic, mono-carboxylic acid having 2 to 8 carbon atoms and an oxidizing agent containing molecular oxygen at pressures of from about 0.5 atmosphere to about 70 atmospheres and at temperatures of from about 30° C. to about 200° C., the catalyst being mercury, selenium, or tellurium, an oxide, or an organic salt of said metals, or mixtures thereof, whereby to produce ester precursors which are allylic esters, and subjecting said allylic ester precursors thereby produced to pyrolysis conditions. thereby producing said isoprene.

4,045,420

NON-OXO-CARBONYL CONTAINING BENZOYL ECGONINE AND COCAINE COMPOUNDS POLYPEPTIDE AND DERIVATIVES THEREOF

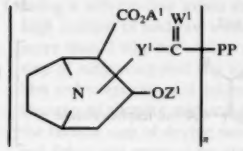
Michael J. Soffer, Redwood City, and Richard S. Schneider, Saratoga, both of Calif., assignors to Syva Company, Palo Alto, Calif.

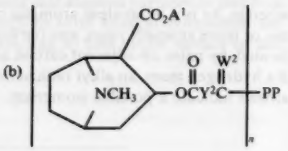
Filed May 29, 1973, Ser. No. 364,842

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 R **6 Claims**

1. A nor-tropane substituted polypeptide including proteins selected from the group consisting of compounds of the formula:





wherein

PP is an antigenic polypeptide, including proteins;

n is at least one;

A^1 is hydrogen or methyl;

Y^1 and Y^2 are hydrocarbylene of from 1 to 10 carbon atoms;

W^1 and W^2 are oxygen or imino; and

Z^1 is hydrogen or benzoyl, wherein the nor-tropane is bonded to the polypeptide through an amino group to form an amide or amidine.

4,045,421

LIGNIN DISPERSANT

Donald E. Wenzel, and Vincent F. Felicetta, both of Bellingham, Wash., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Aug. 10, 1976, Ser. No. 713,295

Int. Cl.[2] C07C *1/00*

U.S. Cl. 260—124 R **8 Claims**

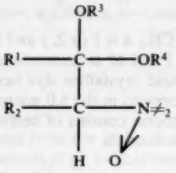
1. A process for the preparation of a dispersant from an aqueous vanillin raffinate obtained upon partial oxidation of lignin, which comprises adding to the aqueous raffinate solution containing from 15 to 30 weight percent solids from 2 to 10 weight percent of formaldehyde, based upon raffinate solids, heating the mixture at a pH in the range of 8 to 11 at a temperature in the range of 60° to 120° C until a substantial portion of the formaldehyde has reacted with the lignin, subsequently acidifying the mixture at a temperature in the range of 70° to 95° C with an inorganic acid to a pH below 2.5 to precipitate and coagulate the lignin, cooling the acidified mixture after coagulation of the precipitate to a temperature below 50° C and separating the precipitated and coagulated lignin from the mixture.

4,045,422
SYNTHESIS OF α-NITROSOKETAL DIMERS

Milorad M. Rogic, Whippany; Michael D. Swerdloff, Parsippany, and Timothy R. Demmin, Morris Plains, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 460,836, April 15, 1974, abandoned. This application July 31, 1975, Ser. No. 600,666
Int. Cl.[2] C07C *105/00, 131/00*
U.S. Cl. 260—143 5 Claims

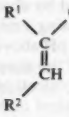
1. A process for the production of an α-nitrosoketal dimer of the formula



wherein R^1 and R^2 are selected from the group consisting of C_1–C_{10} alkyl or phenyl and/or combinations thereof, or in combination together R^1 and R^2 are a part of the C_5–C_{12} cyclic structures, and

R^3 and R^4 are independently selected from the group consisting of C_1–C_{10} alkyl, cyclohexyl and C_1–C_4 alkyl substituted cyclohexyl radicals, comprising the steps of:

a. nitrosating, in the presence of a catalytic amount of a suitable acid and at a temperature of between about −70° and 25° C and at a pressure of between about one atmosphere and 200 psi, an alkoxyalkene of the formula



wherein R^1 and R^2 are selected from the group consisting of C_1–C_{10} alkyl, phenyl and wherein both R^1 and R^2 are part of a C_5–C_{12} carbo-cyclic structure, and R^3 is selected from the group consisting of C_1–C_{10} alkyl, cyclohexyl and C_1–C_4 alkyl substituted cyclohexyl; with at least one molar equivalent of an alkyl nitrite of the formula

R^4ONO

wherein R^4 is selected from the group consisting of C_1–C_{10} alkyl, cyclohexyl and C_1–C_4 alkyl substituted cyclohexyl; and

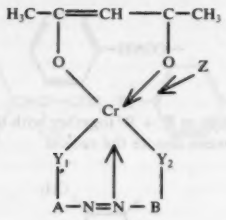
b. isolating the dimer thus formed.

4,045,423
CHROMIUM COMPLEXES OF PHENYLAZOPYRAZOLYL OR PHENYLAZONAPHTHOL DYESTUFFS AND ACETYLACETONE

Claude Marie Henri Emile Brouard, Sotteville les Rouen, and Paulette Gisele Ficht, Mont Saint Aignan, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 25, 1974, Ser. No. 445,183
Claims priority, application France, Mar. 2, 1973, 73.07457
Int. Cl.[2] C09B *45/16;* D06P *1/10, 3/24*
U.S. Cl. 260—147 6 Claims

1. A dyestuff represented by the following structure:



in which A represents phenylene which is unsubstituted or monosubstituted by nitro, chloro or sulpho, or disubstituted by nitro and sulpho or chloro and sulpho or methyl and nitro or chloro and chloro, B represents 1-phenyl-3-methyl-5-pyrazolyl which may be monosubstituted on the phenyl by sulpho, chloro or ethyl; or 1,2 naphthalene, one of A or B is substituted by sulpho, Y_1 represents —O— or

Y_2 represents —O— or

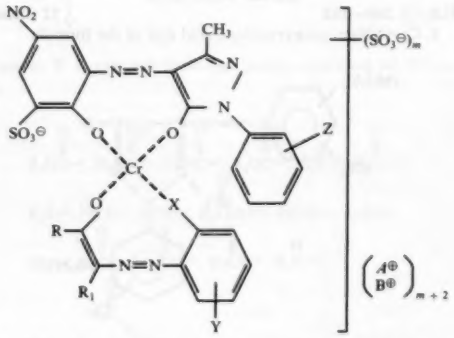
Y_1 and Y_2 are each in a vicinal position with respect to azo, and Z is water, ammonia or pyridine.

4,045,424
SALT OF A SULFONIC ACID SUBSTITUTED 1:2 METAL COMPLEX DYE WITH A BASIC DYE AND AN AMINE

Arnold Tartter, Lambsheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 90,089, Nov. 16, 1970, abandoned. This application Jan. 6, 1976, Ser. No. 646,925
Claims priority, application Germany, Nov. 26, 1969, 1959306
Int. Cl.[2] C09B *45/06, 45/10, 45/16, 45/20*
U.S. Cl. 260—147 4 Claims

1. The salt of a 1:2 metal complex dye having the formula



in which:

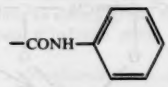
m is zero or 1;

X is —O— or —COO—;

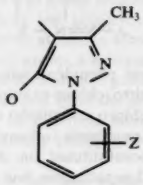
Y is hydrogen, chloro or nitro;

Z is hydrogen or chlorine;

R is



when R^1 is methyl, or R + R^1 together with the linking carbon atoms therebetween denote the radical



in which Z is hydrogen or chlorine;

$A^{\oplus}$ is a cation selected from the class consisting of Rhodamine G, Rhodamine 6G, Rhodamine B, Rhodamine F3B, Rhodamine 3GO, Rhodamine blue 6G, Brilliant green, Malachite green, Auramine, Methyl violet, Crystal violet, and Ethyl violet; and

$B^{\oplus}$ is a cation selected from the class consisting of n-hexylammonium, n-decylammonium, n-dodecylammonium, β-ethylhexylammonium, i-nonylammonium, i-tridecylammonium, γ-ethoxy-, γ-propoxy-, γ-butoxy- γ-isopentoxy- and γ-hexoxypropylammonium, γ- (β-ethylhexoxy)-propylammonium and γ-(i-nonyloxy)-propylammonium.

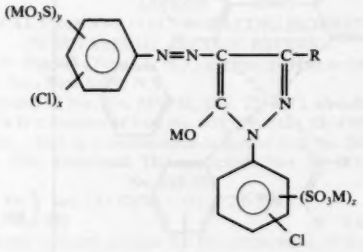
4,045,425

CRYSTALLINE AZOPYRAZOLONE ACID DYE

Frank Ray Hunter, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

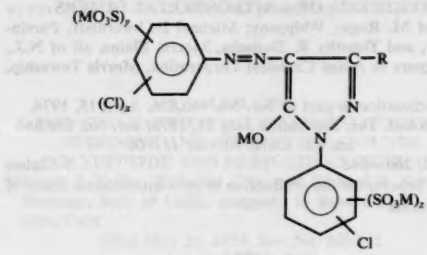
Filed Feb. 19, 1976, Ser. No. 659,512
Int. Cl.[2] C09B *43/00*
U.S. Cl. 260—163 **12 Claims**

1. Crystalline, azopyrazolone acid dye of the formula

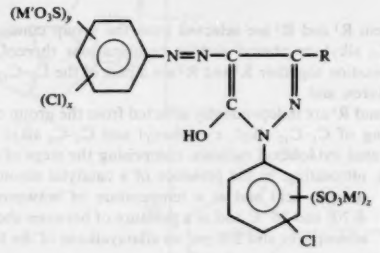


wherein R is H or CH_3, *x* is 1 or 2, *y* and *z* are each 0 or 1, the sum of *y* and *z* is 1 and M is ammonium, lithium, sodium or potassium cation, said crystalline dye being characterized by the absence of absorption in the 6.0 micron region of its infrared scan.

4. Process for preparing the crystalline, azopyrazolone acid dye of the formula



wherein R is H or CH_3, *x* is 1 or 2, *y* and *z* are each 0 or 1, the sum of y and z is 1 and M is ammonium, lithium, sodium or potassium cation, said crystalline dye being characterized by the absence of absorption in the 6.0 micron region of its infrared scan, which process consists of heating the dye which, in enol form, is of the formula



wherein R, *x*, *y* and *z* are as defined above and M′ is a cation, said dye being characterized by absorption in the 6.0 micron region of its infrared scan (using a mineral oil dispersant), in an aqueous liquid medium, at a pH above 10.0, at a temperature of 35° C to the boiling point of the aqueous liquid medium, in the presence of at least two equivalents of the cation M per equivalent of dye, with 0–1 equivalent of M being provided by M′.

4,045,426

BISAZO FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

Chester S. Sheppard, and Ronald E. MacLeay, both of Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 435,623, Jan. 22, 1974, Pat. No. 3,956,269, which is a continuation of Ser. No. 98,893, Dec. 16, 1970, abandoned. This application Mar. 4, 1976, Ser. No. 663,655
Int. Cl.[2] C07C *107/02*
U.S. Cl. 260—174 **4 Claims**

1. A free radical initiator containing ultraviolet light stabilizing groups having the formula:

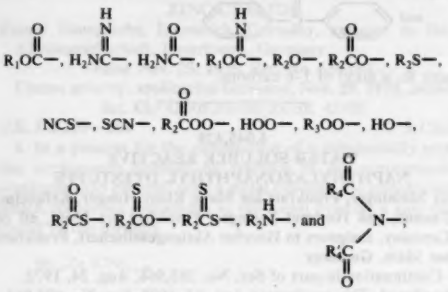
$$(R{-}N{=}N{-})_2R'$$

wherein

R is selected from the group consisting of alkyl of 1–20 carbons, cycloalkyl of 3–10 carbons, aralkyl of 7–20 carbons, aryl of 6–14 carbons, acyl of 2–20 carbons, aroyl of 7–20 carbons, carbamoyl, alkylcarbamoyl of 2–7 carbons, cycloalkylcarbamoyl of 4–11 carbons, $-CO_2Na$, $-CO_2K$, alkoxycarbonyl of 2–7 carbons, cycloalkoxycarbonyl, of 4–11 carbons, aryloxycarbonyl of 7–13 carbons, and

wherein

Y is selected from the group consisting of NC—, N_3—,



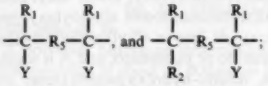
wherein

R_1 and R_2 are selected from the group consisting of alkyl of 1–20 carbons, cycloalkyl of 3–6 carbons, and alkylene of 2–30 carbons when R_1 and R_2 are joined together; and wherein one but not both of R_1 and R_2 can in addition be phenyl, tolyl, xylyl, benzyl, or phenethyl:

R_3 is t-alkyl of 4–8 carbons, t-cycloalkyl of 4–8 carbons or t-aralkyl of 9–15 carbons;

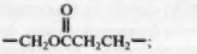
R_4 and R'_4 are alkyl of 1–6 carbons, cycloalkyl of 3–6 carbons, or aryl of 6–12 carbons:

R′ is selected from the groups consisting of di-t-alkylene of 6–20 carbons, di-t-cycloalkylene of 6–20 carbons, di-t-aralkylene of 12–20 carbons,



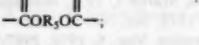
wherein

R_5 is alkylene of 1–10 carbons, cycloalkylene of 3–10 carbons, alkyleneoxyalkylene of 2–20 carbons, and

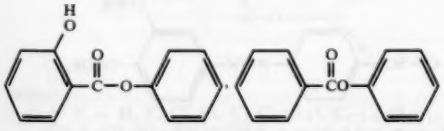


when R is alkyl, cycloalkyl, aralkyl or

R′ can be, in addition, diacyl of 3–10 carbons, diaroyl of 8–14 carbons, arylene of 6–12 carbons, or



and at least one of R and R′ contains an ultraviolet light stabilizing radical or diradical of a compound selected from the group consisting of



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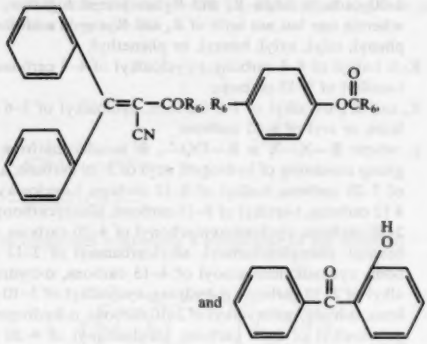


where R_6 is alkyl of 1–6 carbons.

4,045,427

AZO-PEROXIDE FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

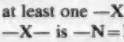
Chester S. Sheppard, and Ronald E. MacLeay, both of Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 435,623, Jan. 22, 1974, Pat. No. 3,956,269, which is a continuation of Ser. No. 98,893, Dec. 6, 1970, abandoned. This application Mar. 4, 1976, Ser. No. 663,654

Int. Cl.[2] **C07C** *107/02*

U.S. Cl. 260—192 **4 Claims**

1. A free radical initiator containing ultraviolet light stabilizing groups having the formula:



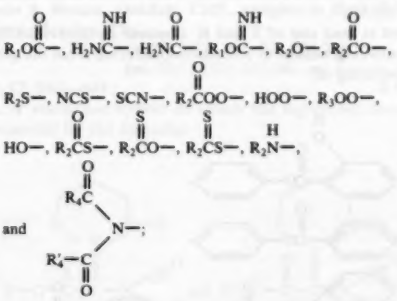
wherein

n is 2 to 4 with the provisos (a) through (e) recited below:

a. at least one —X—X— is —O—O— and at least one —X—X— is —N=N—;

b. where R—X—X— is R—N=N—, R is selected from the group consisting of alkyl 1–20 carbons, cycloalkyl of 3–10 carbons, aralkyl of 7–20 carbons, and

wherein Y is selected from the group consisting of NC—, N_3—,



wherein

R_1 and R_2 are selected from the group consisting of alkyl of

1–20 carbons, cycloalkyl of 3–6 carbons, and alkylene of 2–30 carbons when R_1 and R_2 are joined together; and wherein one but not both of R_1 and R_2 can in addition be phenyl, tolyl, xylyl, benzyl, or phenethyl;

R_3 is t-alkyl of 4–8 carbons, t-cycloalkyl of 4–8 carbons, or t-aralkyl of 9–15 carbons;

R_4 and R'_4 are alkyl of 1–6 carbons, cycloalkyl of 3–6 carbons, or aryl of 6–12 carbons;

c. where R—X—X is R—OO—, R is selected from the group consisting of hydrogen, acyl of 2–20 carbons, aroyl of 7–20 carbons, t-alkyl of 4–12 carbons t-cycloalkyl of 4 12 carbons, t-aralkyl of 9–15 carbons, alkoxycarbonyl of 2–20 carbons, cycloalkoxycarbonyl of 4–20 carbons, carbamoyl, phenylcarbamoyl, alkylcarbamoyl of 2–13 carbons, cycloalkylcarbamoyl of 4–13 carbons, α-hydroxyalkyl of 2–10 carbons, α-hydroxy-cycloalkyl of 3–10 carbons, α-hydroperoxyalkyl of 2–10 carbons, α-hydroperoxycycloalkyl of 3–10 carbons, alkylsulfonyl of 4–20 carbons, cycloalkylsulfonyl of 3–12 carbons, t-alkoxyalkyl of 4–20 carbons, t-alkoxycycloalkyl of 4–20 carbons, Q_3M—, Q_2M',

wherein

M is selected from silicon, germanium, or tin;

M' is boron; and

Q is alkyl of 1–11 carbons, phenyl, benzyl or cyclohexyl;

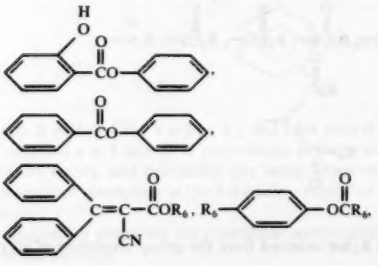
d. R' ia a di, tri or tetravalent radical composed of a combination of two different components for linking the —OO— and —N=N— groups,

(i) when R' is a divalent radical, R' is a combination of a R'_a and a R'_b wherein the component of R'_b for connecting the —OO— linkage is selected from those radicals listed under step (c) except hydrogen, carbamoyl, diethylphosphate, dimethylphosphate, diphenylphosphinic, di-n-octylphosphate and dibutyl phosphinic and the component R'_a for connecting the —N=N— linkage is selected from those radicals listed under step (b); and in addition the component of R'_a for connecting the —N=N— linkage can be selected from aryl of 6–14 carbons, acyl of 2–20 carbons, aroyl of 7–20 carbons, alkylcarbamoyl of 2–7 carbons, cycloalkylcarbamoyl of 4–11 carbons, alkoxycarbonyl of 2–7 carbons, cycloalkoxycarbonyl of 4–11 carbons and aryloxy carbonyl of 7–13 carbons;

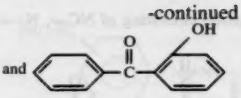
ii. when R' is a trivalent radical R' is defined as a combination of two R'_a and one R'_b or two R'_b and one R'_a wherein the subscripts a and b are in any order and the components of R' can be selected from a combination of the moieties listed under (i) above,

iii. when R' is tetravalent radical, R' is defined as a combination of two R'_a and two R'_b or three R'_a and one R'_b or one R'_a and three R'_b wherein the subscripts a and b can be in any order and the components of R' can be selected from a combination of the moities listed under (i) above;

e. and at least one of R and R' contains an ultraviolet light stabilizing radical of a compound selected from the group consisting of:



-continued



where R_6 is alkyl of 1–6 carbons.

4,045,428

WATER-SOLUBLE REACTIVE NAPHTHYLAZONAPHTHYL DYESTUFFS

Fritz Meininger, Frankfurt am Main; Klaus Hunger, Kelkheim, Taunus, and Hartmut Springer, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

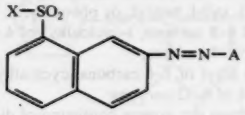
Continuation-in-part of Ser. No. 283,564, Aug. 24, 1972, abandoned. This application Aug. 12, 1975, Ser. No. 603,914

Claims priority, application Germany, Aug. 26, 1971, 2142728

Int. Cl.[2] C09B *62/50, 62/74;* **D06P** *1/06, 1/38*

U.S. Cl. 260—198 **4 Claims**

1. The watersoluble monoazodyestuff of the formula



in which X is $—CH=CH_2$ or $—CH_2—CH_2—Z$, Z is hydroxy, sulfato, chlorine, bromine, lower alkyl-sulfonyloxy, lower alkyl-sulfonylamino, phenyl-sulfonyloxy, lower alkyl-phenyl-sulfonyloxy, phenyl-sulfonylamino, lower alkyloyloxy, monosulfobenzoyloxy, phenoxy, di-(lower alkyl)-amino, tri-(lower alkyl)-ammonium, thiosulfato or phosphato, and A is monosulfo-hydroxynaphthylene, disulfo-hydroxy-naphthylene, trisulfo-hydroxynaphthylene, disulfo-dihydroxy-naphthylene, lower alkyloylamino-monosulfo-hydroxynaphthylene, lower alkenyloylamino-monosulfo-hydroxynaphthylene, benzoylamino-monosulfo-hydroxynaphthylene, N-lower alkyl-N-lower alkyloylamino-monosulfo-hydroxynaphthylene, N-lower alkyl-N-lower alkyloylamino-disulfo-hydroxynaphthylene, lower alkyloylamino-disulfo-hydroxynaphthylene, lower alkenyloylamino-disulfo-hydroxynaphthylene, benzoylamino-disulfo-hydroxynaphthylene, monosulfo-phenylamino-monosulfo-hydroxynaphthylene, monosulfo-aminonaphthylene, disulfo-aminonaphthylene, monosulfo-aminohydroxynaphthylene or disulfoamino-hydroxynaphthylene.

4,045,429

4-(4-HYDROXY- OR ACETOXY-3-CARBOMETHOXYPHENYLAZO)-BENZENESULPHONYL CHLORIDE

Karl Hubert Agback, Uppsala, Sweden, assignor to Pharmacia Aktiebolag, Rapsgatan, Sweden

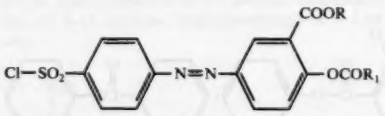
Continuation of Ser. No. 119,834, March 1, 1971, abandoned. This application Apr. 25, 1975, Ser. No. 571,653

Claims priority, application Sweden, Mar. 6, 1970, 2987/70

Int. Cl.[2] C07C *107/04, 107/06*

U.S. Cl. 260—207 **3 Claims**

1. The compound having the formula



wherein R and R_1 each represent a methyl group.

4,045,430

CONVERSION OF o-HALOGENOAZO COMPOUND TO o-CYANOAZO COMPOUND BY REACTION WITH A ZINC CYANIDE

Rainer Hamprecht, Loevenich, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 25, 1975, Ser. No. 635,051
Claims priority, application Germany, Nov. 29, 1974, 2456495
Int. Cl.[2] C09B *29/08, 29/36, 43/00*
U.S. Cl. 260—208 9 Claims

1. In a process for the preparation of a substantially metal-free o-cyanoazo dyestuff by reaction of the corresponding o-halogenoazo dyestuff with a metal cyanide, the improvement which comprises employing as the metal cyanide a zinc compound of the formula

$$Me_mZn(CN)_{2+m}$$

wherein
Me is an alkali metal and
m is the number 0, 1, or 2,
in the presence of 0.1–20 mol percent of a copper-I compound based on the exchangeable halogen in said o-halogenoazo dyestuff at a reaction temperature of 20°–150° C, and recovering the desired o-cyanoazo dyestuff containing less than 0.1% copper and zinc.

4,045,431

FLEXIBLE POLYESTER HAVING A MELTING POINT OF AT LEAST 140° C.

David R. Fagerburg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,947
Int. Cl.[2] C08G *63/16*
U.S. Cl. 260—22 D 2 Claims

1. A polyester having an inherent viscosity of at least 0.6, a flexural modulus of about 30,000 psi or less and a melting point of at least 140° C., the polyester being comprised of
A. a dicarboxylic acid component which is
1. from 90 to 70 mole percent 1,4-cyclohexanedicarboxylic acid having a trans isomer content of at least 80 percent, and
2. from 10 to 30 mole percent dimer acid, and
B. 1,4-cyclohexanedimethanol having a trans isomer content of at least 60 percent.

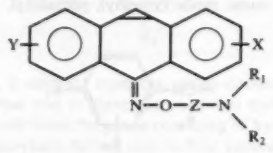
4,045,432

ANTIDEPRESSANT 1,1A,6,10b-TETRAHYDRODIBENZO[a,e]CYCLOPROPA[c]-CYCLOHEPTEN-6-SUBSTITUTED OXIMES

Roy Teruyuki Uyeda, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 616,483, Sept. 26, 1975, Pat. No. 3,960,956, which is a continuation-in-part of Ser. No. 525,877, Nov. 21, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,276
Int. Cl.[2] C07C *131/08*
U.S. Cl. 260—239 B 1 Claim

1. A process for preparing a compound of the formula:

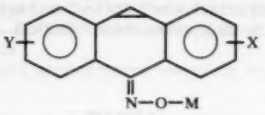


where
X or Y = H, F, Cl, Br, C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3, CH_3S, CH_3SO_2, $SO_2N(CH_3)_2$, provided that one is H;
Z = C_2–C_3 alkylene;
R_1 and R_2 independently = H, C_1–C_4 alkyl, or together can form a ring with N:

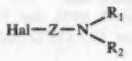
in which W can be
$-(CH_2)_4-$, $-(CH_2)_5-$, or

$-(CH_2)_2O(CH_2)_2-$;

which comprises contacting a compound of the formula:



where M is an alkali metal; with a compound of the formula:



where Hal is a halogen in an inert anhydrous solvent at a temperature of about 10°–50° C.

4,045,433

1,3,4,5-TETRAHYDRO-2H-1,4-BENZODIAZEPIN-2-ONES

Julia Rühricht; Lajos Kisfaludy; Laszlo Urogdi; Eva Palosi; Szabolcs Szeberenyi, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed May 23, 1975, Ser. No. 580,307
Claims priority, application Hungary, May 29, 1974, RI 538
Int. Cl.[2] C07D *243/24*
U.S. Cl. 260—239.3 D 2 Claims

1. 4-Ethoxycarbonyl-5-phenyl-7-nitro-1,3,4,5-tetrahydro-2H-1,4-benzodiazepine-2-one.

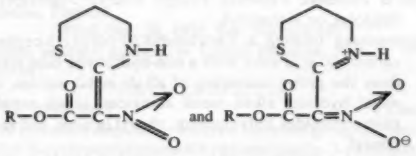
4,045,434

ESTERS OF NITRO(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)ACETIC ACIDS

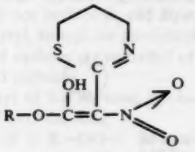
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed July 19, 1976, Ser. No. 706,326
Int. Cl.[2] C07D *279/06*
U.S. Cl. 542—413 3 Claims

1. A resonance hybrid in which the significant forms are represented by the formulae



and the enol form represented by the formula



wherein R represents the moiety

$$-CH_2-CH=CH_n-\text{phenyl},$$

n being one or two, and "phenyl" being the unsubstituted phenyl moiety or such substituted by from one to three of alkyl of from one to three carbon atoms, middle halogen or nitro.

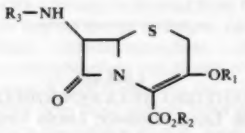
4,045,435

PREPARATION OF CEPHALOSPORIN ETHERS

Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 9, 1974, Ser. No. 513,669
Int. Cl.² C07D *501/02*
U.S. Cl. 544—28 **5 Claims**

1. A process for preparing a cephalosporin ether of the formula

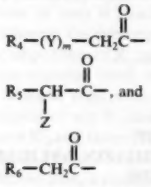


wherein:

R_1 is C_1-C_4 alkyl;

R_2 is a readily removable ester forming group; and

R_3 is a carboxylic acid acyl residue selected from the group consisting of



wherein:

R_4 is 1,4-cyclohexadienyl, phenyl, or phenyl substituted by chlorine, bromine, fluorine, iodine, hydroxy, nitro, amino, cyano, C_1–C_4 alkyl, C_1C_4 alkoxy, Y is O or S, and *m* is zero or one;

R_5 is R_4, 2-thienyl, or 3-thienyl;

Z is protected hydroxy or protected amino;

R_6 is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 5-tetrazolyl, 2-thiazolyl, or 2-oxazolyl;

comprising treating a 7-acylamido-3-hydroxy-3-cephem-4-carboxylic acid ester with a non-hydroxylic base selected from the group consisting of alkali metal amides, alkali metal hydride, alkali metal alkoxides, alkali metal triphenylmethides, butyl lithium, phenyl lithium, and sodium dimsyl,

and a C_1–C_4 alkylfluorosulfonate in an unreactive organic solvent.

4,045,436

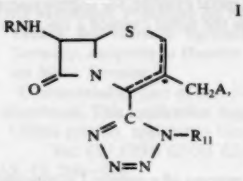
4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

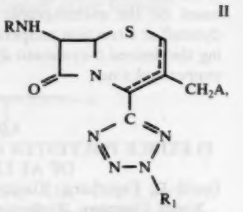
Division of Ser. No. 508,634, Sept. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,303
Int. Cl.² C07D *501/18*
U.S. Cl. 544—23 **13 Claims**

1. A compound selected from the group consisting of

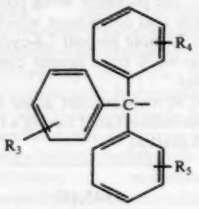
I



II



the acid addition salts thereof when R is hydrogen and the base addition salts thereof when R_1 and R_{11} are hydrogen; said R being selected from the group consisting of hydrogen and

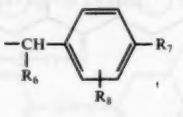


wherein R_3, R_4 and R_5 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl, methoxy and phenyl;

A being selected from the group consisting of hydrogen and acetoxy;

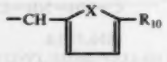
R_1 being selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl

and R_{11} being selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, phthalidyl,



wherein R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, al-

kanoyloxy having two or four carbon atoms, and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,045,437

4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

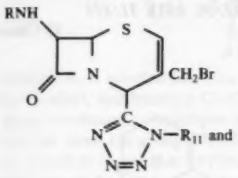
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer, Inc., New York, N.Y.

Division of Ser. No. 658,304, Feb. 17, 1976, which is a division of Ser. No. 508,634, Sept. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Nov. 8, 1976, Ser. No. 739,985

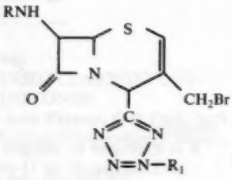
Int. Cl.[2] C07D *501/18*

U.S. Cl. 544—17 **1 Claim**

1. A compound selected from the group consisting of



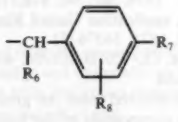
and



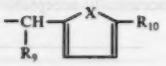
wherein R is hydrogen

R_1 is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl;

and R_{11} is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, phthalidyl,



wherein R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms, and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,045,438

CEPHALOSPORIN ANTIBIOTICS

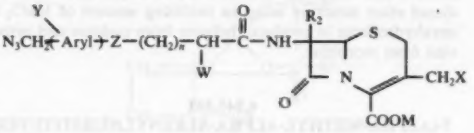
Fortuna Haviv, Montreal, Canada, and Abraham Patchornik, Ness-Ziona, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Oct. 24, 1975, Ser. No. 625,558

Int. Cl.[2] C07D *501/22, 501/30, 501/32*

U.S. Cl. 544—29 **32 Claims**

1. A compound selected from a base of the formula



wherein Aryl is selected from phenyl and 2-thienyl; Y is selected from hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms and a lower alkoxy group of from 1 to 4 carbon atoms with the proviso that when Aryl is 2-thienyl, Y is hydrogen; Z is selected from a bond, oxygen, sulfur and imino with provisio that when Aryl is 2-thienyl, Z is a bond; W is selected from hydrogen, methyl, amino, hydroxy, SO_3H and $COOR_1$ wherein R_1 is selected from hydrogen and 5-indanyl; n is zero, 1 or 2 with the proviso that when W is other than hydrogen or methyl and Z is other than a bond, n is not zero; R_2 is selected from hydrogen, and methoxy; M is selected from hydrogen; a pharmaceutically acceptable non-toxic cation; alkanoyloxymethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; alkanoylaminomethyl wherein the alkanoyl moitety contains from 1 to 5 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; alkoxycarbonylaminomethyl wherein the alkoxy moitey contains from 1 to 4 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; p-(alkanoyloxy)benzyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; and aminoalkanoyloxymethyl wherein the alkanoyl moiety contains from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di-substituted with a lower alkyl group of from 1 to 4 carbon atoms; X is hydrogen or acetoxy; and pharmaceutically acceptable salts thereof.

4,045,439

6-SUBSTITUTED-4-HYDROXYCINNOLIN-3-YL CARBOXYLIC ACIDS AND ESTERS THEREOF

John Preston, and Austin John Reeve, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 28, 1975, Ser. No. 626,531

Claims priority, application United Kingdom, Nov. 7, 1974, 48205/74

Int. Cl.[2] C07D *237/28*

U.S. Cl. 260—250 C **5 Claims**

1. A cinnoline derivative selected from the group consisting of ethyl 6-cyclopentylamino-4-hydroxycinnolin-3-yl carboxylate, ethyl 4-hydroxy-6-isopropylaminocinnolin-3-yl carboxylate, ethyl 4-hydroxy-6-L-phenylalanylaminocinnolin-3-yl car-

boxylate and ethyl 4-hydroxy-6-thienylcinnolin-3-yl carboxylate, and pharmaceutically-acceptable acid-addition salts thereof.

4,045,440

METHOD OF PRODUCING THEBAINE FROM CODEINE AND ORIPAVINE FROM MORPHINE

Henry Rapoport, and Randy B. Barber, both of Berkeley, Calif., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 16, 1976, Ser. No. 724,018
Int. Cl.[2] C07D *489/02*
U.S. Cl. 260—285 **4 Claims**

1. A method of producing thebaine from codeine and oripavine from morphine which comprises (a) producing the 0-6 methyl ethers from codeine and morphine using potassium hydride and methyl iodide as the O-alkylation agents and (b) subsequently oxidizing the respective 0-6 methyl ethers of codeine and morphine to shift from an allylic structure to a dienol ether structure using an oxidizing amount of MnO_2 in tetrahydrofuran to produce thebaine from codeine and oripavine from morphine.

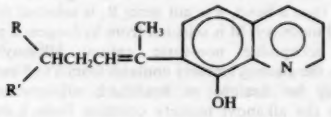
4,045,441

7-(ALPHA-METHYL-ALPHA-ALKENYL)SUBSTITUTED 8-HYDROXYQUINOLINES AND PROCESS FOR THE PREPARATION THEREOF

Harvey J. Richards, Columbus, and Bhupendra C. Trivedi, Worthington, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 10, 1976, Ser. No. 665,467
Int. Cl.[2] C07D *215/24*
U.S. Cl. 260—289 XA **10 Claims**

1. A compound of the formula



wherein R and R′ represent alkyl groups having a sum total of from 4–18 carbon atoms.

5. A process for preparing 7-(alpha-methyl-alpha-alkenylates) of 8-hydroxyquinoline which comprises reacting at a temperature of from about 200°–260° C. one mole of 8-hydroxyquinoline with from 1.1 to 2 moles of a ketone of the formula:

wherein R″ represents H or a C_1 – C_{21} hydrocarbyl group, to effect the condensation of said reactants and the concomitant removal of water of dehydration from the condensate and thereupon distilling the reaction product to recover the resultant alkenylate.

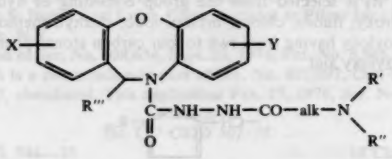
4,045,442

1-(SUBSTITUTED AMINO)ALKANOYL-2-(DIBENZOXAZEPINE-10-CARBONYL)HYDRAZINES AND DERIVATIVES THEREOF

Richard A. Mueller, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 5, 1976, Ser. No. 646,686
Int. Cl.[2] C07D *413/12*
U.S. Cl. 260—293.58 **10 Claims**

1. A compound of the formula



wherein X and Y represent hydrogen, halogen, lower alkyl having 1–7 carbon atoms, trifluoromethyl; alk represents lower alkylene having 1–6 carbon atoms; R′ and R″ together with N represents an azamonocyclic ring wherein the azamonocyclic ring is pyrrolidino, 2,5-dimethylpyrrolidino, hexahydroazepine, piperidino, 4-ethoxycarbonyl-4-phenylpiperidino, 4-hydroxy-4-phenylpiperidino, 4-carboxy-4-phenylpiperidino, and R‴ represents hydrogen or lower alkyl having 1–4 carbon atoms.

4,045,443

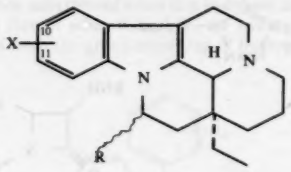
ORGANIC COMPOUNDS

Paul Pfäffli, Arlesheim, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sept. 2, 1975, Ser. No. 609,357
Claims priority, application Switzerland, Sept. 6, 1974, 12153/74; June 3, 1975, 7118/75
Int. Cl.[2] C07D *211/06*; A61K *31/475*
U.S. Cl. 260—293.53 **15 Claims**

1. A compound of formula I,

I



wherein

X is hydrogen or halogen having an atomic number from 9 to 35 in the 10- or 11-position, and or a pharmaceutically acceptable acid addition salt thereof.

4,045,444

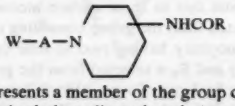
BENZAMIDO PIPERIDINES

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 564,509, April 2, 1975, Pat. No. 3,992,389, which is a continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, abandoned, which is a continuation of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application Apr. 20, 1976, Ser. No. 678,772
Claims priority, application United Kingdom, Sept. 3, 1970, 42090/70; July 22, 1971, 34376/71
Int. Cl.[2] C07D *405/06, 405/12*
U.S. Cl. 260—293.58 **3 Claims**

1. A compound selected from the group consisting of

A. heterocyclic compounds of the formula



in which W represents a member of the group consisting of 3,4 methylene- or 3,4 ethylene-dioxyphenyl, A represents a bivalent radical selected from the group consisting of mono-keto

lower alkylene, hydroxy lower alkylene and radicals having the formula—$OCH_2CHOHCH_2$ or —O— loweralkylene, R represents phenyl and the term "lower" means that the radical contains from 1 to 6 carbon atoms and (B) the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

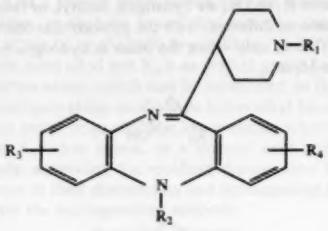
4,045,445

11-(4-PIPERIDYL)DIBENZO-DIAZEPINES

Robert Allis Hardy, Jr., Ridgewood, N.J., and Nicanor Quinones Quinones, New York, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 14, 1975, Ser. No. 637,564
Int. Cl.[2] C07D *401/04*
U.S. Cl. 260—293.59 **20 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen, C_1–C_3 alkyl, and hydroxy C_1–C_3 alkyl; R_2 is selected from the group consisting of hydrogen and C_1–C_3 alkyl; R_3 and R_4 are selected from the group consisting of hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, halogen, hydroxy and trifluoromethyl; and nontoxic acid addition salts thereof.

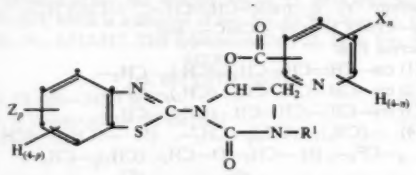
4,045,446

1-BENZOTHIAZOLYL-5-PYRIDYLCARBONYLOXYIMIDAZOLIDINONES

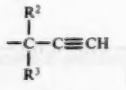
Chin Ching Wu, Libertyville, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed June 17, 1976, Ser. No. 696,995
Int. Cl.[2] C07D *417/14*
U.S. Cl. 260—294.8 C **9 Claims**

1. A compound of the formula



wherein Z is selected from the group consisting of lower alkyl, halogen, lower haloalkyl and lower alkoxy; *p* is an integer from 0 to 2; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and



wherein R^2 and R^3 are each selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms; X is selected from the group consisting of lower alkyl; and *n* is an integer from 0 to 4.

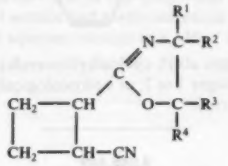
4,045,447

PROCESS FOR PREPARING 2-VINYL OXAZOLINES

Dieter Arlt, Cologne-Buchheim, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 472,016, May 21, 1974, Pat. No. 3,962,270. This application Aug. 26, 1975, Ser. No. 607,984
Claims priority, application Germany, June 9, 1973, 2329545
Int. Cl.[2] C07D *263/14, 263/12*
U.S. Cl. 260—307 F **4 Claims**

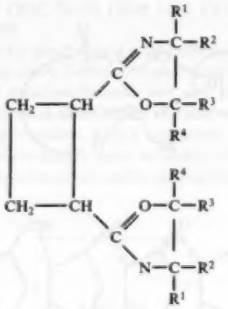
1. 2-oxazoline-2-yl cyclobutane nitriles having the formula



wherein

R^1, R^2, R^3 and R^4 are independently hydrogen, alkyl with up to 4 carbon atoms, hydroxy substituted alkyl with up to 4 carbon atoms, phenyl and substituted phenyl where the substituent is alkyl having 1 or 2 carbon atoms.

3. 1,2-bis-oxazolin-2-yl cyclobutanes having the formula



wherein

R^1, R^2, R^3 and R^4 are independently hydrogen, alkyl with up to 4 carbon atoms, hydroxy substituted alkyl with up to 4 carbon atoms, phenyl and substituted phenyl where the substituent is alkyl having 1 or 2 carbon atoms.

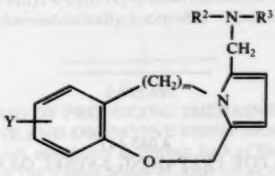
4,045,448

PYRROLO[2,1-c][1,4]BENZOXAZEPINE AND BENZOXAZOCINE DERIVATIVES

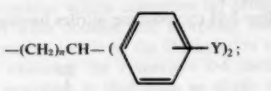
Richard C. Effland, Bridgewater; Larry Davis, Flemington, both of N.J., and Wolfgang Schaub, Kelkheim, Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Feb. 26, 1976, Ser. No. 661,533
Int. Cl.[2] C07D *498/04*
U.S. Cl. 260—326.5 B **9 Claims**

1. A compound of the formula



wherein Y is hydrogen, halogen, lower alkoxy, lower alkyl, trifluoromethyl, nitro or amino; R^2 is alkyl, phenylloweralkyl, alkylaminoalkyl, dialkylaminoalkyl or diphenylloweralkyl of the formula



and R^3 is hydrogen, alkyl, cycloalkylloweralkyl or phenylloweralkyl; *m* the integer 1 or 2; or a physiologically tolerable acid addition salt thereof.

4,045,449

PG-TYPE 1,15-LACTONES

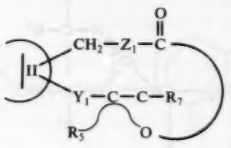
Gordon L. Bundy, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 589,724, June 23, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 670,524

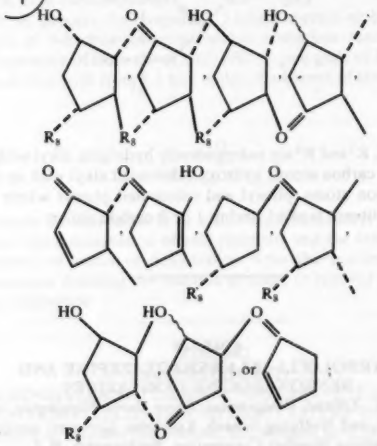
Int. Cl.[2] C07D *313/00*

U.S. Cl. 260—340.2 **90 Claims**

1. A prostaglandin-type, 1,15-lactone of the formula



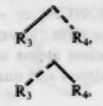
wherein II is



wherein

R_8 is hydrogen or hydroxy;

wherein L_1 is

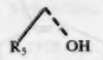


or a mixture of

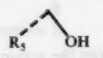
and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro, only when the other is hydrogen or fluoro;

wherein M_1 is

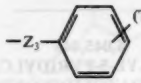


or



wherein R_5 is hydrogen or methyl;

wherein R_7 is $—(CH_2)_m—CH_3$, wherein *m* is one to 5, inclusive, cis—CH=CH-CH_2—CH_3, or



wherein T is chloro. fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, *s* is 0, 1, 2, or 3, and Z_3 is oxa or methylene, with the proviso that not more than two T's are other than alkyl, and the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein Y_1 is trans—CH=CH—, $—CH_2CH_2—$, cis—CH=CH—, or —C≡C—; and

wherein Z_1 is

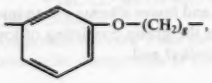
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,

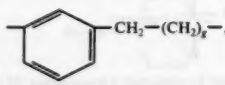
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,

(4) $—(CH_2)_3—(CH_2)_g—CH_2—$, (5) $—(CH_2)_3—(CH_2)_g—CF_2—$, (6) $—CH_2—O—CH_2—(CH_2)_g—CH_2—$,

(7)



(8)



wherein *g* is one to 3, inclusive.

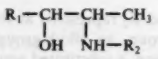
4,045,450

OPTICAL RESOLUTION OF DL-PANTOLACTONE

Akikazu Kinugasa, Takayama; Toshio Okuda, Gifu; Makoto Goto, Takayama, and Mitsuo Saito, Tono, all of Japan, assignors to Alps Pharmaceutical Ind. Co., Ltd., Mukai, Japan

Filed Feb. 12, 1976, Ser. No. 657,660
Claims priority, application Japan, Feb. 19, 1975, 50-21330
Int. Cl.[2] C07D *307/83*
U.S. Cl. 260—343.6 13 Claims

1. A method of optically resolving DL-pantolactone which comprises reacting DL-pantolactone or its basic salt with an opticaly active N-substituted aminophenylpropanol of the general formula:



wherein R_1 is a phenyl group which may be substituted by a halogen atom, an aliphatic lower alkyl group having from 1 to 4 carbon atoms or an aliphatic lower alkoxy group having a 1 to 4 carbon atom alkyl and R_2 is an aralkyl group having from 7 to 10 carbon atoms which may be substituted on the benzene ring by a halogen atom, an aliphatic lower alkyl having from 1 to 4 carbon atoms or an aliphatic lower alkoxy whose alkyl has from 1 to 4 carbon atoms, or a mineral acid addition salt, respectively, separating the resulting diastereomer by the aid of difference in their dissolubility and decomposing the diastereomer into the corresponding antipode.

4,045,451

2-(METHYLTHIO)NAPHTHO[1,3-bc]PYRAN-3(2H)-ONE

David T. Connor, Parsippany, and Maximilian von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 571,890, April 25, 1975, Pat. No. 4,012,422, which is a division of Ser. No. 464,706, April 26, 1974, Pat. No. 3,920,699. This application May 27, 1976, Ser. No. 690,751
Int. Cl.[2] C07D *311/02;* A61K *31/35*
U.S. Cl. 260—345.2 1 Claim

1. 2-(Methylthio)naphtho[1,8-bc]pyran-3(2H)-one.

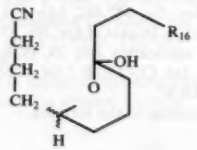
4,045,452

STEROID TOTAL SYNTHESIS PROCESS UTILIZING A CYANOALKYL A-RING PRECURSOR

Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 450,701, March 13, 1974, Pat. No. 3,991,084, which is a division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417. This application Dec. 22, 1975, Ser. No. 642,817
Int. Cl.[2] C07D *309/06*
U.S. Cl. 260—345.9 S 6 Claims

1. A compound of the formula



wherein

R_{16} is lower alkylamino,α-phenethylamino or dehydroabietylamino

and mineral, non-optically active hydrocarbyl monocarboxylic or non-optically active hydrocarbyl dicarboxylic acid addition salts thereof.

4,045,453

METHOD FOR PRODUCING 5-NITRO-2-FURFURYL ACETATE

Ilkka Renvall, Suomenoja, and Tapio Mattila, Kivenlahti, both of Finland, assignors to Kemira Oy, Finland

Filed Aug. 18, 1975, Ser. No. 605,339
Claims priority, application Finland, Sept. 6, 1974, 2624/74
Int. Cl.[2] C07D *307/70*
U.S. Cl. 260—347.4 5 Claims

1. An improved method for the production of 5-nitro-2-furfuryl acetate, wherein furfuryl acetate is caused to react with a mixture containing concentrated nitric acid and less than 7 mole of acetic anhydride per 1 mole furfuryl acetate, in order to produce an intermediate of nitration, whereafter water is added and the aqueous solution is neutralized, then the mixture is heated to 40°–60° C in order to decompose the intermediate of nitration, the improvement comprising: reacting furfuryl acetate with the mixture consisting of nitric acid having a concentration of 60–70% in the proportion of 1-2 mole per mole of furfuryl acetate and acetic anhydride at 0°–20° C and neutralizing the aqueous solution to a pH of 4.7–6.5 .

4,045,454

PRODUCTION OF 1-NITROANTHRAQUINONE AND 1-AMINOANTHRAQUINONE

Eiji Yamada, Takatsuki; Akira Fukasawa, Toyonaka, and Shinzaburo Masaki, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 24, 1975, Ser. No. 625,475
Claims priority, application Japan, Oct. 25, 1974, 49-123714; Apr. 3, 1975, 50-41009
Int. Cl.[2] C07C *79/10;* C09B *1/00;* C07C *79/36*
U.S. Cl. 260—369 21 Claims

1. In a process for producing 1-nitroanthraquinone with high purity by treating crude 1-nitroanthraquinone containing as the main impurities dinitroanthraquinones and β-nitroanthraquinones with an aqueous alkali sulfite or bisulfite solution under heating, the improvement which comprises pulverizing the crude 1-nitroanthraquinone prior to and/or during the treatment with the aqueous alkali sulfite or bisulfite solution.

4,045,455

PROCESS FOR SEPARATING 1,5-DINITROANTHRAQUINONE AND 1,8-DINITROANTHRAQUINONE FROM DINITROANTHRAQUINONE MIXTURES

Axel Vogel, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 17, 1974, Ser. No. 533,595
Claims priority, application Germany, Jan. 3, 1974, 2400164
Int. Cl.[2] C09B *1/00*
U.S. Cl. 260—369 14 Claims

1. A process for separating substantially pure 1,5-dinitroanthraquinone and substantially pure 1,8-dinitroanthraquinone from an anthraquinone dinitration mixture containing 1,5- and 1,8-dinitroanthraquinone which comprises adding to the dinitration mixtures a mixture of concentrated nitric acid and an inert organic solvent, said inert organic solvent being an aliphatic or cycloaliphatic hydrocarbon having up to 12 carbon atoms which can be substituted once or several times by halogen or by a nitro group, separating off the insoluble 1,5-dinitroanthraquinone from the resulting mixture and isolating the 1,8-dinitroanthraquinone from the resulting mother liquor.

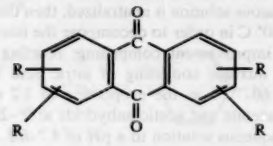
4,045,456
MANUFACTURE OF ANTHRAQUINONES

Franz Merger, Frankenthal; Theodor Jacobsen, Limburgerhof; Heinz Eilingsfeld, Frankenthal; Ernest Miesen, and Gerhard Nestler, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 7, 1976, Ser. No. 693,515
Claims priority, application Germany, June 20, 1975, 2527491
Int. Cl.[2] C09B 1/00
U.S. Cl. 260—369 13 Claims

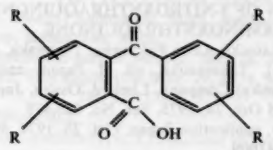
1. A process for the manufacture of anthraquinones of the formula

I



where the individual R's may be identical or different and each R is selected from the group consisting of hydrogen, halogen and alkyl, by cyclizing an o-benzoylbenzoic acid of the formula

II



where R has the above meanings, at elevated temperatures, in which the cyclization is carried out in the presence of a cyclizing agent of an oxygen-containing compound of aluminum and of silicon at a temperature of from 150° to 350° C.

4,045,457
ANTHRAQUINONE DYESTUFFS

Gunter Gehrke, Cologne; Reinold Schmitz, Blecher; Hans-Samuel Bien, Burscheid, and Helmut Herzog, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 20, 1975, Ser. No. 624,292
Claims priority, application Germany, Oct. 23, 1974, 2450287
Int. Cl.[2] C09B 1/10
U.S. Cl. 260—381 7 Claims

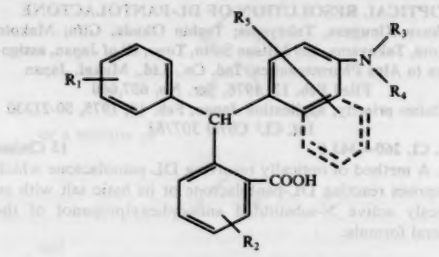
1. Process for the preparation of "α, α'-diamino-α, α'-dihydroxy-β-chloroanthraquinones" comprising warming 2,8-dichloro-1,5-dinitro-anthraquinone, 2,5-dichloro-1,8-dinitro-anthraquinone or mixtures thereof with sulfur in concentrated sulfuric acid or oleum having a maximum SO_3 content of 20% in the presence of boric acid.

4,045,458
PROCESS FOR PREPARING TRIARYLMETHANE DERIVATIVES

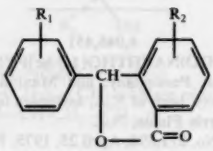
Mitsura Kondo, Kawanishi; Kiyoshi Yasui, Amagasaki; Makoto Miyake, Nishionomiya; Hiroshi Iwasaki, Kawanishi, and Tetsuo Shiraishi, Nishinomiya, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed June 24, 1976, Ser. No. 699,584
Claims priority, application Japan, July 3, 1975, 50-82898
Int. Cl.[2] C09B 11/00, 11/26
U.S. Cl. 260—393 7 Claims

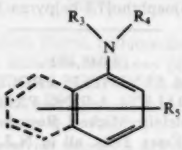
1. A process for preparing a triarylmethane derivative having the general formula:



wherein each R_1 and R_2 represents at least one of hydrogen, halogen, a nitro group, an alkyl group, a substituted alkyl group, an amino group, a substituted amino group, a hydroxyl group, a substituted hydroxyl group, a thiohydroxyl group or a substituted thiohydroxyl group, each R_3 and R_4 represents hydrogen, a substituted or unsubstituted alkyl group, a cycloalkyl group, a substituted or unsubstituted aralkyl group, substituted or unsubstituted aryl group, or a substituted unsaturated alkyl group, R_5 represents at least one of hydrogen, halogen, an alkyl group, a nitro group, a substituted or unsubstituted amino, group, substituted or unsubstituted hydroxyl group, or a substituted or unsubstituted thiohydroxyl group which comprises reacting a 3-phenylphthalide derivative having the general formula:



wherein R_1 and R_2 are the same as described hereinabove, with an aniline derivative having the general formula:



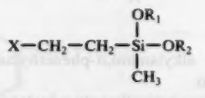
wherein R_3, R_4 and R_5 are the same as hereinabove defined, in the presence of a Friedel-Crafts type catalyst.

4,045,459
AGENT FOR THE REGULATION OF PLANT GROWTH

Werner Foery, Basel; Hanspeter Fischer, Bottmingen; Dieter Lohmann, Pratteln, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 447,402, March 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 278,890, Aug. 9, 1972, abandoned. This application July 29, 1976, Ser. No. 709,827
Int. Cl.[2] C07F 7/04, 7/18
U.S. Cl. 260—448.8 R 7 Claims

1. A silane according to the formula



wherein X represents chlorine or bromine and R_1 and R_2 are identical and represent benzyl radicals, unsubstituted or mono-

or polysubstituted in the phenyl ring by halogen, cyano, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy or C_1–C_4 alkylthio.

4,045,460

PREPARATION OF AMINOALKYLSILANES

Roland Kleinstuck, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 28, 1976, Ser. No. 681,020
Claims priority, application Germany, May 14, 1975, 2521399
Int. Cl.² C07F 7/10, 7/18
U.S. Cl. 260—448.8 R **5 Claims**

1. In the preparation of an aminoalkylsilane of the formula

$$(RO)_{3-n}R_n^1SiR^2NH_2$$

wherein

n is an integer from 0 to 3,

R is an alkyl or alkoxyalkyl radical with 1 to 8 C atoms in each alkyl radical, or an aryl radical with up to 10 C atoms,

R^1 is an alkyl radical with up to 8 C atoms or an aryl radical with up to 10 C atoms, and

R^2 is a divalent hydrocarbon radical with 2 to 10 C atoms,

by reacting the corresponding halogenoalkylsilane with excess ammonia at a temperature above about 80° C, and working up the reaction mixture, the improvement which comprises adding a metal alcoholate to the reaction mixture obtained from the amination before the mixture is worked up.

4,045,461

HIGH TEMPERATURE METHANATION WITH MOLTEN SALT-BASED CATALYST SYSTEMS

Thomas E. Kiovsky, and Milton M. Wald, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 546,371, Feb. 3, 1975, Pat. No. 3,979,332.
This application Mar. 15, 1976, Ser. No. 666,828
Int. Cl.² C07C 1/02, 1/04
U.S. Cl. 260—449 M **11 Claims**

1. A process for the production of methane from a gaseous reactant mixture containing hydrogen and a compound selected from the group consisting of carbon monoxide, carbon dioxide, and mixtures thereof, which comprises contacting said gas mixture in a reaction zone maintained at temperatures above about 500° C with a molten metal salt-based catalyst system comprising a molten metal sald carrier melting below 1000° C; said molten salt having dispersed therein one or more catalytically active metals selected from the class consisting of iron, molybdenum, manganese, nickel, cobalt, zinc, titanium, silver, copper and thorium in the form of finely divided elemental metals, metal oxides, metal carbides and mixtures thereof, wherein said molten metal salt carrier is an iron halide.

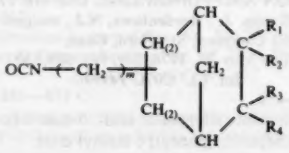
4,045,462

BICYCLIC TRIISOCYANATES

Manfred Bock, Leverkusen; Walter Uerdingen, Schildgen, and Josef Pedain, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 5, 1976, Ser. No. 674,014
Claims priority, application Germany, Apr. 9, 1975, 2515485
Int. Cl.² C07C 119/045
U.S. Cl. 260—453 AP **5 Claims**

1. A composition of matter comprising a triisocyanate corresponding to the following general formula:



wherein

R_1, R_2, R_3 and R_4, which may be the same or different each represent a hydrogen atom, a methyl group or the radical $-(CH_2)_n-NCO$, wherein n is an integer of from 1 to 3, wherein two of the radicals R_1, R_2, R_3 and R_4 represent $-(CH_2)_n-NCO$, and wherein m = 1 to 2.

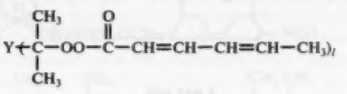
4,045,463

PEROXYESTERS OF SORBIC ACID

Kazuo Matsuyama, Gamagori, and Takeshi Komai, Aichi, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,553
Claims priority, application Japan, Apr. 4, 1975, 50-40372; June 7, 1975, 50-68971
Int. Cl.² C07C 179/18
U.S. Cl. 260—453 RZ **7 Claims**

1. A compound having the formula



wherein l is one or two,

wherein when l is one, Y is alkyl having one to twelve carbon atoms or cycloalkyl having three to twelve carbon atoms, and

wherein when l is two, Y is $-C{\equiv}C-$ or $-(CH_2)_m-$, wherein m is a number of from two to four.

4,045,464

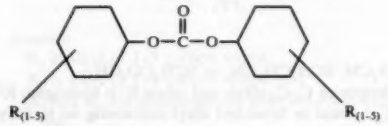
PROCESS FOR THE PREPARATION OF AROMATIC CARBONATES

Ugo Romano, Milan, and Renato Tesei, San Donato Milanese, both of Italy, assignors to Anic, S.p.A., Palermo, Italy

Filed Dec. 1, 1975, Ser. No. 636,604
Claims priority, application Italy, Nov. 25, 1974, 29773/74
Int. Cl.² C07C 68/06
U.S. Cl. 260—463 **4 Claims**

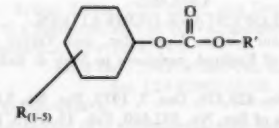
1. A process for the preparation of aromatic carbonates of the formula:

I



wherein R is selected from among the alkyl, alkoxy, aryl, aryloxy, NO_2 groups, and hydrogen, comprising contacting the compound of the formula:

II



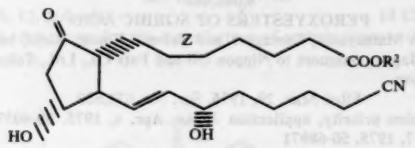
wherein R has the same meaning as in Formula I and wherein R′ is a non tertiary alkyl group, with a catalyst system comprised of titanium tetraphenate or titanium tetramethylate, at a temperature of 25° - 350° C and at a pressure of from 0.1 - 100 atmospheres absolute.

4,045,465
CYANOPROSTAGLANDINS

Hans-Jurgen E. Hess, and Thomas K. Schaaf, both of Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,361
Int. Cl.[2] C07C *121/48*
U.S. Cl. 260—464 3 Claims

1. A compound of the formula



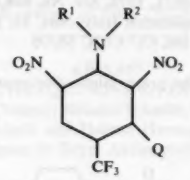
wherein R^2 is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms and 4-biphenylyl; and Z represents a single bond or a cis double bond.

4,045,466
3-CYANOALKYLTHIO- OR 3-ALKOXYCARBONYLMETHYLTHIO-2,6-DINITROANILINES

James R. Beck, Indianapolis, and Joseph A. Yahner, New Palestine, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 668,360, March 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 589,312, June 23, 1975, abandoned. This application Aug. 31, 1976, Ser. No. 719,309
Int. Cl.[2] C07C *101/44, 121/78*
U.S. Cl. 260—465 E 5 Claims

1. A compound of the formula



wherein

Q is SCH_2CN, SCH_2CH_2CN, or $SCH_2CO_2CH_3$;

R^1 is hydrogen or C_1-C_3 alkyl; and when R^1 is hydrogen, R^2 is C_1-C_6 normal or branched alkyl containing no tertiary carbon atom; and

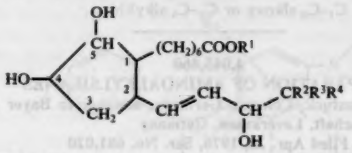
when R^1 is C_1-C_3 alkyl, R^2 is C_1-C_4 nontertiary alkyl.

4,045,467
CYCLOPENTANE DERIVATIVES

Michael Peter Lear Caton, Upminster, and Trevor Parker, Romford, both of England, assignors to May & Baker Limited, England

Division of Ser. No. 423,376, Dec. 7, 1973, Pat. No. 3,933,890, which is a division of Ser. No. 332,660, Feb. 15, 1973, Pat. No. 3,923,872. This application Apr. 30, 1975, Ser. No. 573,107
Claims priority, application United Kingdom, Feb. 18, 1972, 7640/72
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—468 D 9 Claims

1. A cyclopentane of the formula:



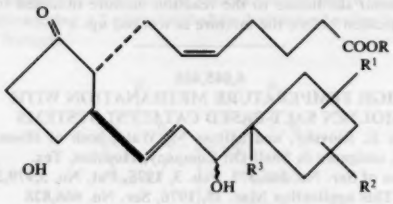
wherein R^1 is hydrogen or alkyl of 1 through 4 carbon atoms, R^2 and R^3 are hydrogen or alkyl of 1 through 4 carbon atoms, and R^4 is hydrogen or alkyl of 1 through 10 carbon atoms, and, when R^1 is hydrogen, non-toxic salts thereof.

4,045,468
16-CYCLOBUTYL-PROSTAGLANDINS

Masayasu Kurono, Osaka; Hisao Nakai, and Takashi Muryobayashi, both of Ibaragi, all of Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

Filed Mar. 11, 1975, Ser. No. 557,437
Claims priority, application Japan, Mar. 14, 1974, 49-28544
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—468 D 9 Claims

1. A compound of the formula:



wherein R represents a hydrogen atom or methyl group, R^1 and R^2 represent hydrogen atoms and R^3 represents an alkyl group containing from 1–6 carbon atoms, the non-toxic salts thereof when R is hydrogen, the C_1 to C_{12} alkyl esters thereof, and the cyclodextrin clathrates thereof.

4,045,469
INSECTICIDAL ESTERS OF SPIRO CARBOXYLIC ACIDS

Wayne I. Fanta, Colerain Township, Hamilton County, and Joel I. Shulman, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 157,033, June 25, 1971, Pat. No. 3,823,177. This application May 16, 1973, Ser. No. 360,864
Int. Cl.[2] C07C *69/76, 63/337, 63/44*
U.S. Cl. 260—469 5 Claims

1. 2,2-dimethyl-4,5-benzospiro[2.4]hepta-4,6-diene-1-carboxylic acid.

2. 2,2-dimethyl-4,5-benzospiro[2.4]hepta-4-ene-1-carboxylic acid.

5. The allethrolone ester of 2,2-dimethyl-4,5,6,7-dibenzospiro[2,4]-hepta-4,6-diene-1-carboxylic acid.

4,045,470
ALKYL ALLOPHANATES, METHOD FOR PREPARATION AND FUNGICIDAL USE OF THE SAME

Paul William Knapp, Jr., Bordentown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 24, 1976, Ser. No. 689,030
Int. Cl.[2] C07C *149/40*
U.S. Cl. 260—470 1 Claim

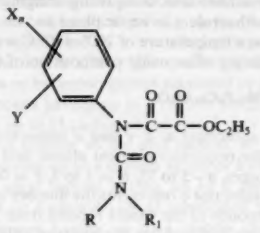
1. The compound: allophanic acid-, 3-thio-4-{o-[(2,2,2-trichloroethylidene)amino]phenyl}-, methyl ester.

4,045,471
PROCESS FOR PREPARING N-CARBAMOYL ETHYL OXANILATES

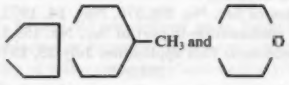
Alexander Mihailovski, Kensington, and Jimmy H. Chan, Martinez, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 29, 1975, Ser. No. 582,054
Int. Cl.² C07C *127/22, 131/11;* **C07D** *207/06, 295/20*
U.S. Cl. 260—471 A **8 Claims**

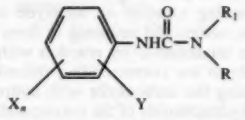
1. A process for the production of N-carbamoyl ethyl oxanilates having the formula



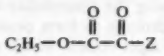
in which X and Y are independently selected from the group consisting of chloro, bromo and trifluoromethyl; *n* is either zero or one; and R and R_1 are independently selected from the group consisting of lower alkyl and lower alkoxy from C_1 to C_3 inclusive, or R and R_1 taken together is selected from the group consisting of



comprising reacting in an inert solvent a urea having the formula



with an ethyl oxalyl halide having the formula



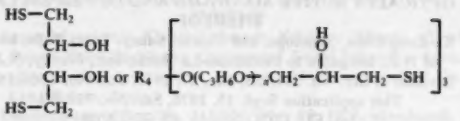
wherein Z is selected from the group consisting of chloro and bromo.

4,045,472
URETHANE POLYTHIOLS

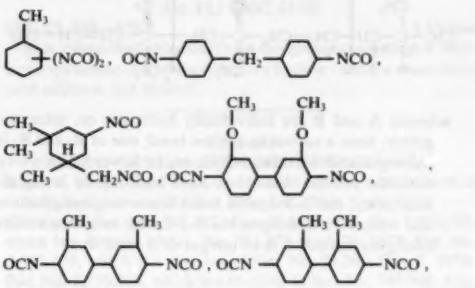
James Leverette Guthrie, Ashton, and Clifton Leroy Kehr, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 546,707, Feb. 3, 1975, abandoned. This application Dec. 15, 1975, Ser. No. 640,499
Int. Cl.² C07C *149/437*
U.S. Cl. 260—471 C **6 Claims**

1. A urethane polythiol prepared by admixing and reacting at 0°–100° C: (a) a di- or trihydric polythiol having the formula



in which R_4 is a saturated trivalent hydrocarbon moiety having 12–24 carbon atoms and *n* is 1–2; and (b) a diisocyanate selected from the group consisting of



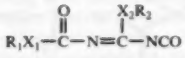
, and OCN—$CH_2(CH_2)_4CH_2$—NCO, the diisocyanate and the di- or trihydric polythiol being admixed in amounts to provide 1 equivalent of —NCO per 0.5–2 equivalent of —OH.

4,045,473
ALKOXYCARBONYLISOUREA ISOCYANATES

Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 11, 1975, Ser. No. 603,651
Int. Cl.² C07C *127/26, 155/02, 157/14*
U.S. Cl. 260—482 C **6 Claims**

1. A compound in solution in an inert organic solvent, which compound has the formula:



wherein

R_1 is alkyl of 1–3 carbon atoms;

R_2 is alkyl of 1–4 carbon atoms; and

X_1 and X_2 are independently selected from oxygen and sulfur.

4,045,474
LOW VISCOSITY POLY(EPOXIDE-CAPROLACTONE) POLYOLS

Robert Arthur Taller, Charleston, and Decker Kuykendall Elder, S. Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,399
Int. Cl.² C08G *63/06*
U.S. Cl. 260—484 A **6 Claims**

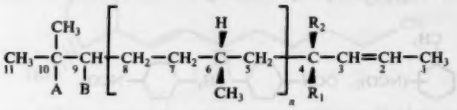
1. An adduct of a polycaprolactone polyol and a cycloaliphatic diepoxide comprising the reaction product of (a) at least two polycaprolactone polyols differing in average hydroxyl number by an amount from 250 to 400 and having average hydroxyl numbers from about 180 to about 600 and (b) a cycloaliphatic diepoxide, said adduct having a viscosity of less than 5,000 cks. at 130° F. and an equivalent weight of at least 150.

4,045,475
OPTICALLY ACTIVE ALCOHOLS AND LOWER ESTERS THEREOF

Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169.
This application Sept. 15, 1976, Ser. No. 723,401
Int. Cl.[2] C07C *69/145, 69/02, 33/02*
U.S. Cl. 260—488 H 6 Claims

1. A compound of the formula:



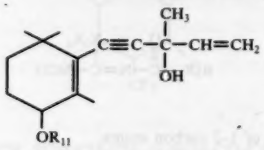
wherein A and B are individually hydrogen or, taken together, form a carbon to carbon bond; one of R_1 and R_2 is hydrogen and the other is hydroxy or lower alkanoyloxy with the proviso that when R_1 is hydroxy or lower alkanoyloxy, the 2–3 double bond has a cis configuration and when R_1 is hydrogen, the 2–3 double bond has a trans configuration and n is an integer of from 0 to 1.

4,045,476
1-(2,6,6-TRIMETHYL-3-HYDROXY OR LOWER ALKANOYLOXYCYCLOHEXEN-1-YL)-3-METHYL-4-PENTEN-1-YN-3-OL COMPOUND

Michael Rosenberger, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 585,224, June 9, 1975, Pat. No. 4,000,198.
This application Sept. 15, 1976, Ser. No. 723,411
Int. Cl.[2] C07C *175/00*
U.S. Cl. 260—488 R 2 Claims

1. A compound of the formula:



wherein R_{11} is hydrogen or lower alkanoyl.

4,045,477
ACETOXYLATION PROCESS

Martin B. Sherwin, Wayne, and I-Der Huang, West Paterson, both of N.J., assignors to Chem Systems Inc., New York, N.Y.

Filed July 17, 1975, Ser. No. 596,903
Int. Cl.[2] C07C *67/05*
U.S. Cl. 260—497 R 10 Claims

1. A process for preparing vicinal hydroxycarboxylates and vicinal dicarboxylates which comprises contacting an olefin with molecular oxygen in the liquid phase in the presence of a carboxylic acid at a temperature of at least 160° C. in a reaction zone in the presence of a catalyst of a tellurium metal ion and an iodide source, said carboxylates being the same as the carboxylate group in said carboxylic acid.

4,045,478
METHOD FOR THE PREPARATION OF METHACRYLIC ACID

Sumio Umemura; Kyoji Ohdan; Kenichi Suzuki, and Fumio Adachi, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Feb. 18, 1976, Ser. No. 658,909
Claims priority, application Japan, Feb. 28, 1975, 50-23904; Mar. 12, 1975, 50-29117
Int. Cl.[2] C07C *51/32*
U.S. Cl. 260—530 N 10 Claims

1. A method for the preparation of methacrylic acid by oxidation of methacrolein, comprising bringing a reaction feed containing methacrolein in vapor phase and molecular oxygen into contact at a temperature of 200°–450° C with an oxidation catalyst consisting of an oxide composition of the formula (I):

$$Mo_aP_bCa_cAs_dO_e \quad (I)$$

wherein the subscripts a, b, c and d respectively denote the numbers of the respective element atoms, said numbers being within the ranges, $a = 5$ to 15, $b = 1$ to 3, $c = 0.1$ to 3, $d = 0.1$ to 3, and the subscript e represents the number of oxygen atoms which corresponds to the oxides formed from the above mentioned elements and satisfies the average valency of the elements, said number e being within the range of 16 to 60.

4,045,479
PROCESS OF PREPARING PENICILLAMINE

Friedrich Asinger, Rott; Heribert Offermanns, Grossauheim, and Karl-Heinz Gulzek, Alpen, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation of Ser. No. 306,370, Nov. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 158,512, June 30, 1971, abandoned. This application July 25, 1975, Ser. No. 598,995
Claims priority, application Germany, July 3, 1970, 2032952; May 11, 1971, 2123232; Nov. 15, 1971, 2156601
Int. Cl.[2] C07C *99/00*
U.S. Cl. 260—534 S 8 Claims

1. In a process of preparing penicillamine or a homologue thereof by reacting together an aldehyde branched at the α-carbon atom, sulfur, and ammonia to form a thiazoline-Δ^3, converting the thiazoline-Δ^3 by reaction with anhydrous hydrogen cyanide to the corresponding thiazolidine-4-carbonitrile, hydrolyzing the carbonitrile with hydrochloric acid to form first the hydrochloride of the corresponding thiazolidine-4-carboxamide and then, at a higher temperature, to form the hydrochloride of the thiazolidine-4-carboxylic acid and an ammonium salt, separating the ammonium salt from the mixture and decomposing the thiazolidine-4-carboxylic acid hydrochloride by hydrolysis to form penicillamine or a homologue thereof, the improvement which consists essentially of the step of hydrolyzing the carbonitrile to the carboxamide by heating at a temperature between about 40° and 70° C a mixture of the carbonitrile and at least the amount of aqueous hydrochloric acid containing at least 30% by weight of hydrogen chloride that is required stoichiometrically to form the corresponding thiazolidine-4-carboxamide hydrochloride.

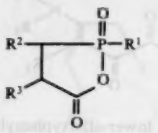
4,045,480
PROCESS FOR PREPARING 1,2-OXA-PHOSPHOLANES

Manfred Finke, Fischbach, Taunus; Hans-Jerg Kleiner, Kronberg, Taunus, and Elmar Lohmar, Rodenkirchen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 11, 1976, Ser. No. 695,126
Claims priority, application Germany, June 14, 1975, 2526689
Int. Cl.[2] C07F *9/30*
U.S. Cl. 260—545 P 11 Claims

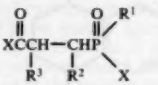
1. Process for preparing 2,5-dioxo-1,2-phospholanes of the formula (I)

(I)



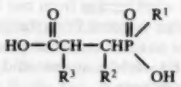
wherein R^1 represents an alkyl radical, optionally halogen substituted, having up to 18 carbon atoms, a cycloalkyl radical having up to 8 carbon atoms, an alkenyl radical having up to 8 carbon atoms, an aryl radical having up to 14 carbon atoms which may be substituted by lower alkyl groups having up to 4 carbon atoms, lower alkoxy groups having up to 4 carbon atoms, halogen or by amino groups alkylated or dialkylated by lower alkyl groups having up to 4 carbon atoms or an aralkyl radical having up to 15 carbon atoms which may be substituted in an analogous manner as the aryl radical, R^2 represents an alkyl radical having up to 4 carbon atoms or hydrogen and R^3 represents an alkyl radical having up to 6 carbon atoms, a phenyl radical or a phenyl radical substituted by halogen or lower alkyl groups having up to 4 carbon atoms, a benzyl radical or hydrogen, which comprises reacting 2-halogeno-formylethylphosphinic acid halides of the formula (II)

(II)



wherein R^1, R^2 and R^3 are defined as in formula (I) and X represents chlorine or bromine, with approximately an equimolar quantity of water or a phosphinic-carboxylic acid of the formula (III)

(III)



4,045,481
PROCESS FOR THE PREPARATION OF CHLORINATED ISOCYANIDE DICHLORIDE

Dieter Arlt, Cologne-Buchheim, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 793,926, Jan. 21, 1969, abandoned. This application July 17, 1975, Ser. No. 596,866

Claims priority, application Germany, Feb. 2, 1968, 1668089

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 D **5 Claims**

1. Process for preparing chlorinated isocyanide dichloride which comprises reacting an olefine selected from the group consisting of vinyl chloride, vinyl fluoride and vinyl bromide, with at least equimolar quantities of chlorine and cyanogen chloride in the presence of a Friedel-Crafts catalyst at a temperature of from about −30° C to about 70° C.

4,045,482
4-(3-ISOPROPYLAMINO-2-HYDROXYPROPOXY INDENE

Masuo Murakami; Kiyoshi Murase; Kunihiro Niigata, all of Tokyo; Shiro Tachikawa, Omiya, and Toichi Takenaka, Ageo, all of Japan, assignors to Yamanouchi Pharmaceutical Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 141,936, May 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 876,070, Nov. 12, 1969, abandoned. This application Apr. 14, 1975, Ser. No. 568,097

Claims priority, application Japan, Nov. 12, 1968, 43-82297; Sept. 11, 1969, 44-72582

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570.7 **4 Claims**

1. A compound selected from the group consisting of 4-(3-isopropylamino-2-hydroxypropoxy)indene and a non-toxic acid addition salt thereof.

4,045,483
AMIDINOUREAS AND AMIDINOTHIOUREAS

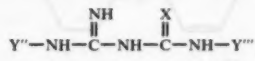
Royal A. Cutler, Sand Lake, and Samuel Schalit, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 585,447, June 9, 1975, Pat. No. 4,009,163, which is a division of Ser. No. 391,473, Aug. 24, 1973, Pat. No. 3,988,370, which is a division of Ser. No. 79,266, Oct. 8, 1970, Pat. No. 3,798,269, which is a division of Ser. No. 749,986, Aug. 5, 1968, Pat. No. 3,652,766, which is a continuation-in-part of Ser. No. 556,897, June 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 462,077, June 7, 1965, abandoned. This application June 10, 1976, Ser. No. 694,768

Int. Cl.² C07C *127/15*; A61K *31/17*

U.S. Cl. 260—552 R **3 Claims**

1. A compound having the structural formula



wherein: X is oxygen or sulfur; Y‴ and Y⁗ may be the same or different and are members of the group consisting of alkenyl containing 3–18 carbon atoms, alkoxyalkyl containing 3–17 carbon atoms, alkylthioalkyl containing 3–17 carbon atoms, cycloalkyl containing 3–8 carbon atoms, di(lower alkyl-)aminoalkyl containing 4–10 carbon atoms; Y‴ also is hydrogen when X is oxygen and Y⁗ is alkenyl containing 3–18 carbon atoms, alkylthioalkyl containing 3–17 carbon atoms, di(lower alkyl)aminoalkyl containing 4–10 carbon atoms; and Y‴ also is hydrogen when X is sulfur and Y⁗ is alkyl containing 8–18 carbon atoms, alkoxyalkyl containing 3–17 carbon atoms, alkylthioalkyl containing 3–17 carbon atoms, cycloalkyl containing 3–8 carbon atoms, di(lower alkyl)aminoalkyl containing 4–10 carbon atoms.

4,045,484
PROCESS FOR PREPARING N'-METHYL ACETHYDRAZIDE

Russell E. Malz, Jr., Naugatuck; Roger W. Amidon, Oxford, and Harold Greenfield, Watertown, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 596,544, July 16, 1975, Pat. No. 3,965,174. This application June 21, 1976, Ser. No. 698,452

Int. Cl.² C07C *103/32*

U.S. Cl. 260—561 H **6 Claims**

1. A process for the production of N'-methylacethydrazide which comprises reacting acethydrazide, paraformaldehyde, and hydrogen, in a solvent and in the presence of a palladium catalyst, said solvent being selected from the group consisting of water, lower aliphatic alcohols, and mixtures thereof, at a temperature of from 20° to 150° C, a hydrogen partial pressure of from 1.0 to 10,000 psi, and an equivalent ratio of acethydrazide to paraformaldehyde of from 0.1/1 to 10/1.

4,045,485

NAPHTHYL ACETALDEHYDE DERIVATIVES; METHODS OF USE THEREOF; AND PROCESSES FOR THE PREPARATION THEREOF

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Palo Alto, Calif.

Division of Ser. No. 566,554, April 9, 1975, abandoned, which is a division of Ser. No. 492,380, July 29, 1974, abandoned, which is a division of Ser. No. 250,733, May 5, 1972, Pat. No. 3,852,363, which is a division of Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713, which is a continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012. This application Nov. 5, 1976, Ser. No. 739,362

Int. Cl.[2] C07C *131/00, 47/56*

U.S. Cl. 260—566 A **3 Claims**

1. 2-(5'-fluoro- 6'-methoxy-2'-naphthyl) propionaldehyde and the oxime thereof.

4,045,486

PROCESS FOR PREPARING AZOMETHINES

Hermann-Dieter Krall, Meerbusch, and Hans-Helmut Schwarz, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

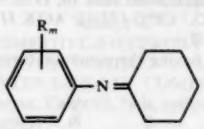
Filed May 12, 1976, Ser. No. 685,557

Claims priority, application Germany, June 6, 1975, 2525295

Int. Cl.[2] C07C *119/00*

U.S. Cl. 260—566 R **7 Claims**

1. Process for preparing an azomethine of the formula



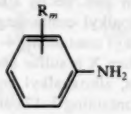
wherein

R is hydrogen, alkyl or alkoxy,

m denotes an integer of from 1 to 4, and

the *m* R radicals are the same or different,

which comprises condensing cyclohexanone and a primary aromatic amine of the formula



wherein

R and *m* are as defined above.

in the presence of an acid ion exchanger.

4,045,487

1-DIMETHYLAMINO-2,4-DIPHENYL-1-BUTENE-3,4-DIONE

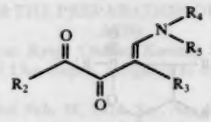
Roy Cleeland, Jr., Short Hills; Emanuel Grunberg, North Caldwell; Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 590,655, June 26, 1975, Pat. No. 3,969,373, which is a continuation-in-part of Ser. No. 338,019, March 5, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 668,179

Int. Cl.[2] C07C *97/03*

U.S. Cl. 260—570.5 C **2 Claims**

1. A compound of the formula



wherein R_2 is phenyl, lower-alkoxyphenyl, di-lower-alkoxyphenyl, R_3 is phenyl, naphthyl or nitrophenyl, and R_4 and R_5 taken independently are each lower alkyl.

4,045,488

AMINOPHENYLTETRALIN COMPOUNDS

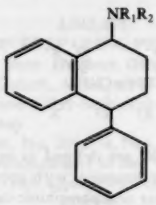
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 521,451, Nov. 6, 1974, abandoned, which is a continuation of Ser. No. 292,526, Sept. 27, 1972, abandoned. This application May 27, 1976, Ser. No. 690,709

Int. Cl.[2] C07C *87/64*

U.S. Cl. 260—576 **13 Claims**

1. A compound selected from the group consisting of the trans-isomers of 1-amino-4-phenyltetralin bases of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 is a member selected from the group consisting of hydrogen and alkyl having from one to three carbon atoms, and R_2 is a member selected from the group consisting of alkyl having from one to three carbon atoms and cycloalkyl having from three to six carbon atoms, said R_2 only being cycloalkyl when r_1 is hydrogen.

4,045,489

PROCESS FOR PRODUCING CIS-JASMONE

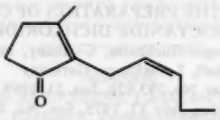
Wilhelmus Johannen Wiegers, Red Bank, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,544

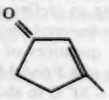
Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—586 C **4 Claims**

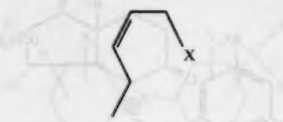
1. A process for producing cis-jasmone having the structure:



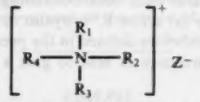
comprising the step of intimately admixing 3-methyl cyclopentenone-2 having the structure:



with a cis pentenyl halide having the structure:



in the presence of a base and a "phase transfer agent" having the generic formula:



wherein at least one of R_1, R_2, R_3 and R_4 is C_6-C_{14} aryl, C_6-C_{10} aralkyl, C_6-C_{20} alkyl, C_6-C_{14} aralkyl and C_6-C_{20} alkenyl and the other of R_2, R_3 and R_4 is C_1-C_8 alkyl, and Z^- is an anion selected from the group consisting of halogen anion and hydroxyl anion and wherein X is chloro or bromo, said reaction being carried out in a two liquid phase system; the reaction temperature being in the range of from 30° C up to 120° C; the mole ratio of 3-methyl cyclopentenone-2:cis-pent-2-enyl halide being in the range of from 0.5:1.5 up to about 1.5:0.5; the concentration of "phase transfer agent" in the reaction mass based on the amount of 3-methyl cyclopentenone-2 being in the range of from 0.5 grams of phase transfer agent per mole of 3-methyl cyclopentenone-2 up to 25 grams of phase transfer agent per mole of 3-methyl cyclopentenone-2; the reaction being carried out in a solvent inert to the reaction system, selected from the group consisting of toluene, benzene, o-xylene, m-xylene, p-xylene, ethyl benzene, n-hexane and cyclohexane; and then fractionally distilling the resulting product whereby a residue and a distillate are formed; and recovering said cis-jasmone from said distillate.

4,045,490

9,10-SECO-STEROID PREPARATION

Jean-Marie Cassal, St. Louis, France; Andor Furst, Basel, and Werner Meier, Bottmingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

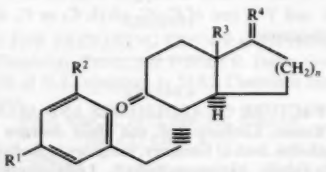
Division of Ser. No. 533,101, Dec. 16, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,764

Claims priority, application Switzerland, Dec. 21, 1973, 18029/73

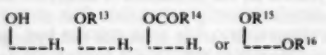
Int. Cl.[2] **C07C** *49/76, 49/82, 49/84*

U.S. Cl. 260—590 FA **8 Claims**

1. A process for the preparation of a compound of the formula

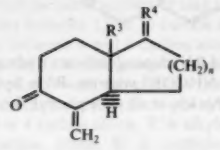


wherein R^1 and R^2 independently are hydrogen, amino, OR^5, $OCOR^6$ or $NHCOR^5$ wherein R^5 is hydrogen or lower alkyl and R^6 is lower alkyl or phenyl; R^3 is lower alkyl; R^4 is oxo,

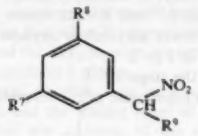


wherein R^{13} is lower alkyl, lower alkoxy-lower alkylene, tetrahydropyranyl or teytrahydrofuryl, R^{14} is lower alkyl or phenyl and R^{15} and R^{16} are lower alkyl or taken together form lower alkylene or arylene of 6 to 10 carbon atoms, and *n* is 1 or 2, which comprises the steps of

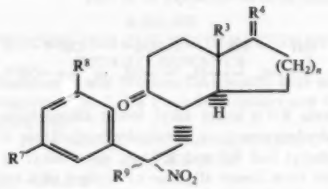
a. condensing a compound of the formula



wherein R^3, R^4 and *n* are as hereinbefore defined with a compound of the formula

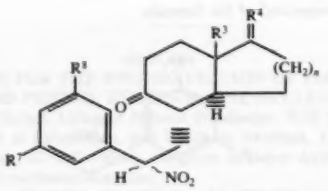


wherein R^7 and R^8 independently and respectively are R^1 and R^2, nitro, benzyloxy, dephenylmethoxy or triphenylmethoxy, and R^9 is hydrogen, cyano or $COOR^{10}$ wherein R^{10} is lower alkyl or benzyl, in the presence of a base to give a compound of the formula



wherein R^3, R^4, R^7, R^8 and *n* are as hereinbefore defined;

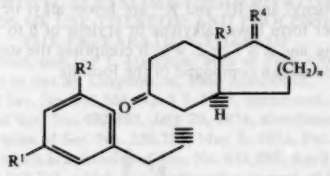
b. saponifying and then decarboxylating a compound obtained in step (a) when R^9 is cyano or $COOR^{10}$ wherein R^{10} is a hereinbefore defined in the presence of alkali and then in the presence of acid to give a compound of the formula



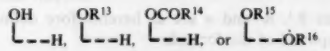
wherein R^3, R^4, R^7, R^8 and *n* are as hereinbefore defined, and

c. hydrogenating a compound obtained in step (b) in the presence of a noble metal or nickel catalyst.

6. A process for the preparation of a compound of the formula



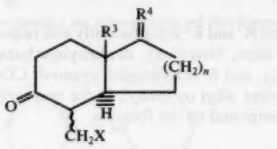
wherein R^1 and R^2 independently are hydrogen, amino, OR^5, $OCOR^6$ or $NHCOR^5$ wherein R^5 is hydrogen or lower alkyl and R^6 is lower alkyl or phenyl; R^3 is lower alkyl; R^4 is oxo,



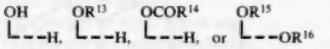
wherein R_{13} is lower alkyl, lower alkoxy-lower alkylene, tetrahydropyranyl or tetrahydrofuryl, R^{14} is lower alkyl or phenyl and R^{15} and R^{16} are lower alkyl or taken together form lower alkylene or arylene of 6 to 10 carbon atoms, and n is 1 or 2,

which comprises the steps of

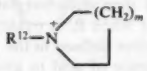
a. condensing a compound of the formula



wherein R^3 is lower alkyl; R^4 is oxo,

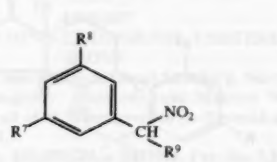


wherein R^{13} is lower alkyl, lower alkoxy-lower alkylne, tetrahydropyranyl or tetrahydrofuryl, R^{14} is lower alkyl or phenyl and R^{15} and R^{16} are lower alkyl or taken together form lower alkylene or arylene of 6 to 10 carbon atoms; X is OR^{11}, $N(R^{12})_2$, SR^{11}, $N^+(R^{12})_3$,



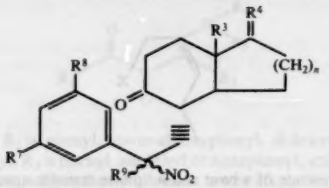
or $S^+(R^{12})_2$ wherein R^{11} is hydrogen, lower alkyl, acetyl or benzoyl, R^{12} is lower alkyl, and m is 1 or 2; and n is 1 or 2,

with a compound of the formula



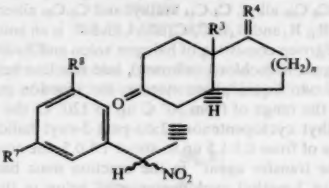
wherein R^7 and R^8 independently and respectively are R^1 and R^2, nitro, benzyloxy, diphenylmethoxy or triphenylmethoxy, and R^9 is hydrogen, cyano or $COOR^{10}$ wherein R^{10} is lower alkyl or benzyl,

in the presence of a base to give a compound of the formula



wherein R^3, R^4, R^7, R^8 and n are as hereinbefore defined;

b. saponifying and then decarboxylating a compound obtained in step (a) when R^9 is cyano or $COOR^{10}$ wherein R^{10} is as hereinbefore defined in the presence of alkali and then in the presence of acid to give a compound of the formula



wherein R^3, R^4, R^7, R^8, R^9 and n are as hereinbefore defined, and

c. hydrogenating a compound obtained in step (b) in the presence of a noble metal or nickel catalyst.

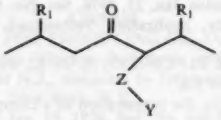
4,045,491

α-OXY(OXO) SULFIDES AND ETHERS

William J. Evers, Red Bank, and Howard H. Heinsohn, Jr., Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,538
Int. Cl.[2] C07C *49/175*
U.S. Cl. 260—594 **9 Claims**

1. An alpha oxo sulfide or oxo ether having the structure:



wherein Z is one of sulfur or oxygen; wherein R_1 is methyl or hydrogen; and Y is one of C_1–C_4 alkyl, C_3 or C_4 alkenyl, or 1,3-diethylacetonyl.

4,045,492

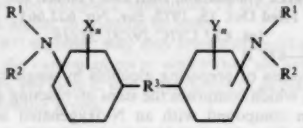
MANUFACTURE OF ALDEHYDES AND ALCOHOLS

Wilhelm Kniese, Limburgerhof, and Hans Juergen Nienburg, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 16, 1970, Ser. No. 3,522
Claims priority, application Germany, Jan. 18, 1969, 1902460
Int. Cl.[2] C07C *45/08, 29/16*
U.S. Cl. 260—604 HF **6 Claims**

1. In a process for the production of aldehydes and alcohols by oxo synthesis involving the reaction of an olefin having 2 to 20 carbon atoms with carbon monoxide and hydrogen at pressures ranging from 1 to 300 atmospheres in the presence of an amine and a carbonyl complex of cobalt, the improvement

comprising using as said amine a diamino diphenyl alkane having the formula



where R^1 and R^2 stand for alkyl radicals of 1 to 4 carbon atoms, R^3 stands for an alkylene or alkylidene radical of 1 to 3 carbon atoms, X and Y respectively stand for hydrogen or methyl, and n is 0,1 or 2 at temperatures in the range of 100°–140° C.

4,045,493

HYDROFORMYLATION OF OLEFINS

Alvin E. Trevillyan, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 546,323, Feb. 3, 1975, Pat. No. 3,998,864. This application Apr. 19, 1976, Ser. No. 678,185

Int. Cl.² C07C *45/10, 29/16*

U.S. Cl. 260—604 HF **3 Claims**

1. A process for the production of aldehydes and alcohols which comprises contacting an olefinic hydrocarbon having about 4 to about 19 carbon atoms with carbon monoxide and hydrogen at the temperature of about 100°–300° C and a pressure of about 10–2,000 psig in the presence of a heterogeneous catalyst consisting of a polyphenylene comprising benzene ring structures bonded into a polymer chain wherein the amount of benzene ring structures bonded to three or more other benzene ring structures is from 15 to 25 percent by weight, the amount of benzene ring structures bonded to two other benzene ring structures is from 45 to 65 percent by weight, and the amount of benzene ring structures is bonded through the meta position to two other benzene ring structures is from 15 to 30 percent by weight, with the remaining benzene ring structures being bonded to only one other benzene ring structure, said polyphenylene having a number average molecular weight in the range of about 1,000 to about 10,000, said polyphenylene having $—PR_2$ substituents, where R is a phenyl or an alkyl group in amounts such that the ratio of aryl groups to phosphorus atoms is in the range of about 1.0 to about 20, said $—PR_2$ groups being complexed with a metal carbonyl compound selected from the group consisting of cobalt, rhodium, ruthenium, osmium, iridium, and iron carbonyls in amounts such that the ratio of phosphorus atoms to metal atoms is in the range of from about 1 to about 20.

4,045,494

METHOD FOR PREPARING TRIOGRANOPHOSPHINES

Vilas M. Chopdekar, Parlin, and William R. Davis, South Plainfield, both of N.J., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Mar. 6, 1975, Ser. No. 556,010

Int. Cl.² C07F *9/50*

U.S. Cl. 260—606.5 P **4 Claims**

1. A method for preparing a triorganophosphine, said method comprising the steps of

1. adding to a reaction zone maintained under an inert atmosphere an organomagnesium halide of the formula RMgX and a phosphorus trihalide PX_3 such that three moles of the organomagnesium halide are added separately and concurrently with each mole of the phosphorus trihalide, wherein said reaction zone also contains either a linear ether of the formula R^1OR^2 or $R^3(OR^4)_nOR^3$ or a cyclic ether of the general formula

wherein R represents an alkyl group containing between 1 and 16 carbon atoms, a cycloalkyl, aryl, alkaryl or aralkyl group such that the alkyl portion of said alkaryl or aralkyl group contains between 1 and 16 carbon atoms, R^1 and R^2 each contain between 1 and 6 carbon atoms and are individually selected from the group consisting of alkyl, cycloalkyl and phenyl with the proviso that R^1 and R^2 cannot both be methyl, cycloalkyl or phenyl, R^3 is alkyl and contains 2, 3 or 4 carbon atoms, R^4 is alkylene and contains 2, 3 or 4 carbon atoms, R′ is methylene, ethylene or =CHR‴, wherein R‴ is alkyl and contains between 1 and 16 carbon atoms, R″ is unsubstituted alkylene such that R′ and R″ together contain 3 or 4 cyclic carbon atoms, and together with the oxygen atom and Y group form a ring containing 5 or 6 atoms, n is between 1 and 4, inclusive, X is chlorine, bromine or iodine and Y is a methylene or an N-alkyl group containing between 1 and 16 carbon atoms, with the proviso that when Y represents an N-alkyl group, the Y group and the oxygen atom are separated by 2 atoms and said ring contains 6 atoms,

2. maintaining said reaction zone at a temperature of between ambient and the boiling point of the reaction mixture throughout the addition of the organomagnesium halide and phosphorus trihalide,
3. adjusting the pH of the reaction mixture to less than 7 by the addition of an aqueous solution containing a non-oxidizing mineral or carboxylic acid,
4. removing the aqueous layer of the reaction mixture, and
5. removing at least a portion of the solvent from the organic layer of the reaction mixture to isolate the resultant triorganophosphine, R_3P.

4,045,495

PROCESS FOR THE PREPARATION OF TRIARYLBORANES

Nicholas Nazarenko, and William Carl Seidel, both of Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1975, Ser. No. 630,995

Int. Cl.² C07F *5/04*

U.S. Cl. 260—606.5 B **7 Claims**

1. In a process for the preparation of triarylboranes by reacting an alkali metal, an aryl halide and a borate ester in an inert organic solvent at a ratio of halide to ester in the range of about 3.5:1 to 3:1 and thereafter contacting the reactants with water to obtain an aqueous solution of the alkali metal hydroxide salt of the triarylborane, the improvement which comprises recovering said triarylborane, the improvement which comprises recovering said triarylborane by acidifying said aqueous solution of a pH not less than about 6 to precipitate the borane and thereafter separating the triarylborane from the aqueous solution.

4,045,496

PROCESS FOR THE HYDROXYLATION OF PHENOLS AND PHENOL ETHERS IN THE NUCLEUS

Hermann Seifert, Cologne; Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Gloebusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1975, Ser. No. 553,939

Claims priority, application Germany, Mar. 6, 1974, 2410758

Int. Cl.² C07C *37/00*

U.S. Cl. 260—613 D **20 Claims**

1. In a catalytic process for the hydroxylation of the nucleus of a phenol or phenol ether wherein a phenol or phenol ether

is contacted with hydrogen peroxide at a temperature of 20°–150° C and at a pressure of 0.1 to 500 Torr employing 3 to 20 moles of said phenol or phenol ether per mole of hydrogen peroxide and the resulting hydroxylated phenol or phenol ether is recovered, the improvement which comprises employing a substantially anhydrous hydrogen peroxide obtained by distilling off said hydrogen peroxide together with the phenol or phenol ether to be hydroxylated from a nonaqueous solution whose solvent boils at a temperature higher than said phenol or phenol ether to be hydroxylated and affecting the hydroxylation in the presence of a strong acid either before or after condensing the vapor mixture which forms during the said distillation.

4,045,497

PROCESSES FOR PRODUCING ALKENALS AND INTERMEDIATES THEREFOR

William L. Schreiber, Ocean, and Alan O. Pittet, Atlantic Highlands, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 597,189, July 18, 1975, abandoned, which is a division of Ser. No. 383,579, July 30, 1973, Pat. No. 3,922,309. This application Mar. 8, 1976, Ser. No. 664,916

Int. Cl.[2] C07C *43/30*; A61K *7/46*

U.S. Cl. 260—615 A **2 Claims**

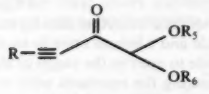
1. A process for the production of 2-alkylidene-3-alkynal dialkoxy acetals which comprises:

i. reacting a lower alkyl metallo acetylide having the formula:

$$R-C\equiv C-M$$

wherein R is lower alkyl and M is an alkali metal selected from the group consisting of lithium, sodium and potassium, with a dialkoxy acetonitrile wherein the alkoxy groups contain from 1 to 6 carbon atoms in the presence of a solvent selected from the group consisting of dialkyl ethers and aromatic hydrocarbons, thereby forming an imine salt;

ii. hydrolyzing the imine salt at a temperature in the range of from about 0° C up to approximately 30° C using an aqueous acid selected from the group consisting of lower carboxylic acids having a concentration of 3 molar or less and mineral acids having a concentration of 1 molar or less, thereby forming an acetylenic ketone having the structure:

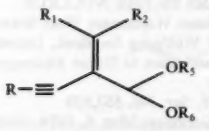


wherein R_2 is lower alkyl and R_5 and R_6 are C_{1-C6} alkyl; and

iii. reacting at from about 0° C to about 50° C said acetylenic ketone with a phosphorous compound having the structure:

$$(R_7)_3P=C-R'$$

to form a 1,1-dialkoxy-2-alkylidene-3-alkyne having the formula:



wherein R_5 and R_6 are C_1–C_6 alkyl groups; R_7 is phenyl; one of R_1 and R_2 is hydrogen and the other is methyl or ethyl; and R′ is the alkyl group represented by R_1 or R_2.

4,045,498

METHOD OF HYDROXYLATION

Norman C. Deno, State College, Pa., assignor to Fats and Proteins Research Foundation, Inc., Des Plaines, Ill.

Filed Oct. 15, 1975, Ser. No. 622,661

Int. Cl.[2] C07C *29/00, 31/18*

U.S. Cl. 260—617 R **27 Claims**

1. The process of preparing alcohols by single-carbon hydroxylation, which comprises the steps of: reacting a saturated hydrocarbon compound with an N-oxygenated amine in a medium including a Lewis acid and a ferrous salt; and separating the reaction product from said medium.

2. The process according to claim **1** in which the N-oxygenated amine is a di-alkylsubstituted hydroxylamine compound.

6. The process according to claim **1** in which the N-oxygenated amine is selected from the group consisting of N-oxygenated aliphatic, alicyclic and heterocyclic amines.

7. The process according to claim **6** in which the amine oxide is trimethylamine oxide.

8. The process according to claim **6** in which the amine oxide is a cyclic aza-alkane oxide.

4,045,499

PROCESS FOR THE PREPARATION OF 1,1,3,3-SUBSTITUTED HYDROXY INDANES

Alfons Klein, Duesseldorf, and Karlfried Wedemeyer, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

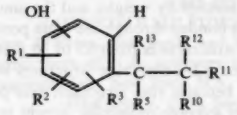
Filed Oct. 22, 1974, Ser. No. 516,945

Claims priority, application Germany, Nov. 14, 1973, 2356813

Int. Cl.[2] C07C *37/00*

U.S. Cl. 260—621 R **9 Claims**

1. Process for producing 1,1,3,3-substituted hydroxy indanes which comprises reacting an alkylphenol having the formula



wherein

R^1, R^2 and R^3, which may be the same or different, are selected from the group of hydrogen, halogen, alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl portion and up to 14 carbon atoms in the aryl portion, phenyl, naphthyl, anthryl, and the foregoing substituted by alkyl with up to 12 carbon atoms, in addition to which

R^2 and R^3, when they are in the ortho position relative to one another may be taken together with the carbon atoms of the benzene ring to which they are attached to form a ,5-membered carbocylic ring,

R^5 is selected from the group of alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl portion and up to 14 carbon atoms in the aryl portion, phenyl, naphthyl, anthryl, and the foregoing substituted by alkyl with up to 12 carbon atoms,

R^{10} and R^{11} which may be the same or different, are selected from the group of hydrogen and alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl portion and up to 14 carbon atoms in the aryl portion, phenyl, naphthyl, anthryl, and the foregoing substituted by alkyl with up to 12 carbon atoms, in addition to which

R^5 and R^{10} may form a cycloaliphatic ring with the carbon atoms to which they are attached,

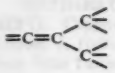
R^{12} is hydrogen, and

R^{13} is halogen, hydroxyphenyl or —OR^{14} where R^{14} is selected from the group of hydrogen and alkyl with up to 12

carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl portion and up to 14 carbon atoms in the aryl portion, phenyl, naphthyl, anthryl, and the foregoing substituted by alkyl with up to 12 carbon atoms, in addition to which

R^{12} and R^{13} together may also represent another bond between the carbon atoms to which they are attached,

with 2 moles, per mole of said alkylphenol, of an olefin containing the following group,



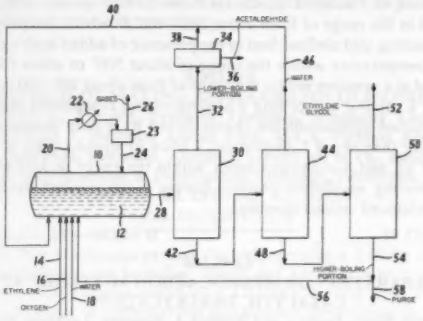
in which at least one double-bonded carbon atom contains only carbon-to-carbon bonds, or with a compound which yields the corresponding olefin in situ, in the presence of an acid catalyst at a temperature in the range from 70° to 360° C.

4,045,500

PREPARATION OF ETHYLENE GLYCOL

Olav T. Onsager, Suffern, N.Y., and Peter L. Szecsi, Montclair, N.J., assignors to Halcon International, Inc., New York, N.Y.

Filed May 28, 1976, Ser. No. 691,113
Int. Cl.² C07C *29/02, 47/06*
U.S. Cl. 260—635 H **4 Claims**



1. A process for preparing ethylene glycol, which comprises reacting ethylene, molecular oxygen and water in the presence of an iodine source in an oxidation zone at a temperature of 50° - 250° C. and under a pressure sufficient to maintain the liquid phase to produce a liquid reaction product, separating said product into a plurality of portions, including a higher-boiling portion and a product ethylene glycol portion, and recycling said higher-boiling portion to said oxidation zone.

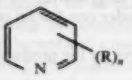
4,045,501

METHOD FOR MAKING o- AND p-HALOALKYL STYRENES

Thomas A. Bianchi, Irondequoit, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 391,180, Aug. 24, 1973, Pat. No. 3,927,117, which is a continuation-in-part of Ser. No. 237,902, March 27, 1972, abandoned. This application Aug. 4, 1975, Ser. No. 601,870
Int. Cl.² C07C *25/14*
U.S. Cl. 260—651 R **12 Claims**

1. In a method for making o- and p-chloromethylstyrenes comprising the steps of mixing ethyl benzene, paraformaldehyde and hydrogen chloride and reacting said mixture with bromine to form a mixture of o- and p-chloromethyl(1-bromoethyl)benzenes, the improvement which comprises: heating and dehydrobrominating said o- and p- chloromethyl(1-bromoethyl) benzenes with an equimolar amount of an amine acceptor of the formula



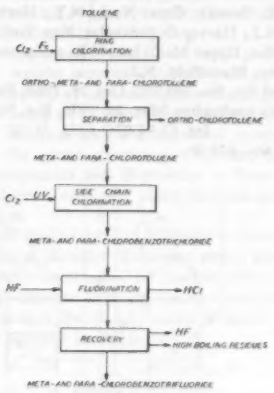
wherein R is alkyl of 1 to 6 carbon atoms, *n* is an integer of 1 to 5 and at least one alkyl is attached to a carbon atom adjacent the nitrogen atom in said formula, provided that the alkyls may be the same or different where, *n* is more than 1; whereby a mixture of said o- and p-chloromethyl styrenes is formed.

4,045,502

PROCESS FOR PRODUCING HIGH PURITY PARA-CHLOROBENZOTRIFLUORIDE

Sudhir K. Bhutani, Orange, and Willard A. Nichols, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 29, 1976, Ser. No. 727,813
Int. Cl.² C07C *25/14*
U.S. Cl. 260—651 F **3 Claims**



1. In a process for making para-chlorobenzotrifluoride wherein a mixture comprising meta- and para-chlorobenzotrichloride is reacted with hydrogen fluoride, the improvement which comprises

terminating the fluorination reaction when no more than 99% by weight of said para-chlorobenzotrichloride has been converted to para-chlorobenzotrifluoride and no more than 50% by weight of said meta-chlorobenzotrichloride has been converted into meta-chlorobenzotrifluoride.

4,045,503

ALKYL FLUORIDE STORAGE STABILIZATION AND ALKYLATION WITH STORED ALKYL FLUORIDE

Thomas Hutson, Jr., and Wayne P. Kraus, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 5, 1976, Ser. No. 673,324
Int. Cl.² C07C *17/42, 3/54*
U.S. Cl. 260—652.5 P **12 Claims**

1. A storage-stable composition comprising an alkyl fluoride diluted with a stabilizing amount of a paraffinic hydrocarbon having from 4 to 8 carbon atoms in an amount sufficient to prevent degradation of said fluoride to polymer formation during storage and handling.

4. A method for rendering alkyl fluoride storage-stable

under conditions conducive to polymer formation which comprises diluting said alkyl fluoride with a paraffinic hydrocarbon having from 4 to 8 carbon atoms in an amount effective to prevent any substantial degradation of alkyl fluoride during storage and handling under conditions conducive to polymer formation.

7. An improved process for the production of alkylate which comprises

a. hydrofluorinating an olefin-containing hydrocarbon stream with HF under hydrofluorination conditions which produce alkyl fluorides,

b. diluting the hydrofluorination effluent comprising alkyl fluorides with a paraffinic hydrocarbon having from 4 to 8 carbon atoms in an amount sufficient to prevent any substantial degradation of said fluoride to heavy polymer oil during storage and handling and transferring from storage to a place of utilization subsequent to hydrofluorination,

c. storing said paraffin-diluted alkyl fluoride, and

d. passing said paraffin-diluted alkyl fluoride obtained in step (b) after storage and handling in step (c) to alkylation and therein contacting same with an isoparaffin and HF under alkylation conditions to produce alkylate.

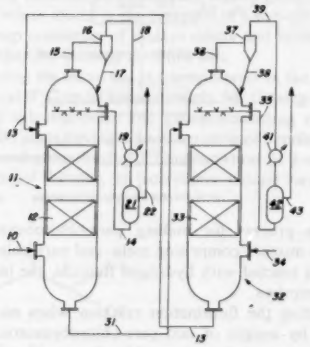
4,045,504
COUPLING PROCESS

Maurice E. Brooks, Great Neck, N.Y.; Herbert Riegel, Palisades, N.J.; Harvey D. Schindler, New York, N.Y., and Morgan C. Sze, Upper Montclair, N.J., assignors to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 769,791, Oct. 23, 1968, Pat. No. 3,947,489. This application Mar. 29, 1976, Ser. No. 671,388

Int. Cl.[2] C07C *3/52, 15/10*

U.S. Cl. 260—669 R **19 Claims**



1. A process for coupling an alkane with at least one member selected from the group consisting of different alkanes, having a number of carbon atoms different than the number of carbon atoms of said alkane, alkenes, and aromatic hydrocarbons, comprising:

contacting the alkane and said member, both in the vapor phase, with a molten mixture comprising a multivalent metal halide in both its higher and lower valence state, said multivalent metal halide being selected from the group consisting of the chlorides, iodides and bromides of copper, manganese, iron, cobalt and chromium, said contacting being effected at a temperature from about 500° to about 1,200° F to produce a reaction effluent containing a coupled compound containing a number of carbon atoms corresponding to the total number of carbon atoms in said alkane and said member, said coupled compound when said member is said different alkane or said alkene being selected from the group consisting of alkanes, alkenes and mixtures thereof, and said coupled compound when said member is said aromatic hydrocarbon being selected from the group consisting of alkyl and alkenyl substituted derivatives of said aromatic hydrocarbon and mixtures thereof.

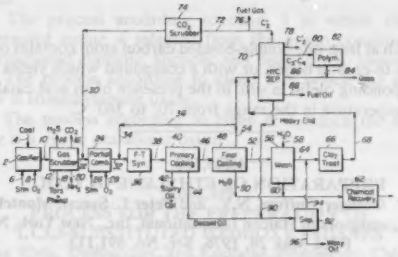
4,045,505
METHOD FOR UPGRADING A FISCHER-TROPSCH LIGHT OIL

Henry R. Ireland, Woodbury; Alan W. Peters, and Thomas R. Stein, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 21, 1976, Ser. No. 650,994

Int. Cl.[2] C07C *5/22;* **C10G** *35/06*

U.S. Cl. 260—673 **7 Claims**



1. A method for increasing the on stream life of a catalyst during increasing the octane rating of an olefin rich C_5+ liquid product of Fischer-Tropsch synthesis having an end boiling point in the range of from about 340°–400° F which comprises contacting said olefinic feed in the presence of added hydrogen at a temperature within the range of about 500° to about 850° F and at a pressure within the range of from about 200–600 psig with a catalyst comprising a hydrogenating component and a crystalline aluminosilicate characterized by a pore dimension greater than about 5 Angstroms, a silica to alumina ratio of at least 12, and a constraint index within the range of 1:12 and recovering an olefinic gasoline boiling range product having an enhanced octane number.

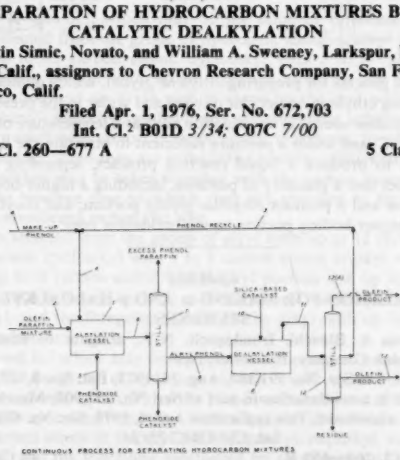
4,045,506
SEPARATION OF HYDROCARBON MIXTURES BY CATALYTIC DEALKYLATION

Milutin Simic, Novato, and William A. Sweeney, Larkspur, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 1, 1976, Ser. No. 672,703

Int. Cl.[2] B01D *3/34;* **C07C** *7/00*

U.S. Cl. 260—677 A **5 Claims**



CONTINUOUS PROCESS FOR SEPARATING HYDROCARBON MIXTURES

1. A process for separating a close-boiling mixture comprising substantially linear olefins and paraffins which comprises the steps of:

1. contacting a paraffin-dilute substantially linear olefin mixture with a phenolic compound in the presence of an aluminum or magnesium phenoxide alkylation catalyst

under conditions effective to cause olefin alkylation between the olefin and the phenol to prepare alkylphenols;
2. recovering the alkylphenols;
3. heating the alkylphenols in the presence of a silica-based dealkylation catalyst at a temperature below about 300° C under conditions effective to regenerate the olefin at conversions of from about 70–80% by weight; and
4. rapidly separating the paraffin-free olefin.

4,045,507

METHOD OF OLIGOMERIZING 1-OLEFINS

Barrett L. Cupples, Franklin Township, Allegheny County; William J. Heilman, Allison Park, and A. Norman Kresge, Penn Hills Township, Allegheny County, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 633,671
Int. Cl.[2] C07C *3/18*
U.S. Cl. 260—683.15 B **10 Claims**

1. The continuous process for polymerizing a 1-olefin to an oligomer mixture including trimer and tetramer which comprises continuously introducing a 1-olefin having from about five to about 14 carbon atoms or a mixture thereof into the first of a series of two or more tank reactors in the presence of a catalytic amount of boron trifluoride and a co-catalyst that complexes with boron trifluoride with mixing therein to provide a substantially homogeneous reaction mixture and continuously removing a partially oligomerized product stream from the first of said tank reactors and introducing said product stream into the second of said tank reactors for further conversion of said 1-olefin to oligomer product, said series of tank reactors being maintained at a same or different temperature suitable for the oligomerization reaction.

4,045,508

METHOD OF MAKING ALPHA-OLEFIN OLIGOMERS

Barrett L. Cupples, Franklin Township, Allegheny County; William J. Heilman, Allison Park, and A. Norman Kresge, Penn Hills Township, Allegheny County, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 633,677
Int. Cl.[2] C07C *3/18*
U.S. Cl. 260—683.15 B **10 Claims**

1. The continuous process for polymerizing a 1-olefin to an oligomer mixture including trimer and tetramer which comprises continuously introducing a 1-olefin having from about five to about 14 carbon atoms or a mixture thereof into the first of a series of one or more tank reactors with mixing therein to provide a substantially homogeneous reaction mixture in the presence of a catalytic amount of boron trifluoride and a co-catalyst that complexes with boron trifluoride and continuously removing a partially oligomerized product stream from said series of one or more tank reactors and flowing said product stream through a tube reactor for further conversion of said 1-olefin to oligomer product, the length to diameter ratio of said tube reactor being at least about 15 to one and said series of tank reactors and said tube reactor being maintained at a same or different temperature suitable for the oligomerization reaction.

4,045,509

ISOMERIZATION OF PARAFFINIC HYDROCARBONS WITH FUSED SALT COMPLEX OF ALUMINUM HALIDE AND MANGANOUS HALIDE DEPOSITED ON A CARRIER

Herbert L. Benson, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 593,336, July 3, 1975, Pat. No. 3,992,326. This application Aug. 20, 1976, Ser. No. 716,031
Int. Cl.[2] C07C *5/28*
U.S. Cl. 260—683.75 **25 Claims**

1. A process for the isomerization of less-branched paraffinic hydrocarbons to more-branched paraffinic hydrocarbons which comprises contacting said less-branched paraffinic hydrocarbons in the vapor phase at a reaction temperature of from about 180° to about 250° F in the presence of hydrogen and a hydrogen halide with a solid catalytic composition comprising a fused salt complex of an aluminum halide selected from the class consisting of aluminum chloride, aluminum bromide and mixtures thereof and a manganous halide selected from the class consisting of manganous chloride, manganous bromide and mixtures thereof; present on the surfaces of a porous, refractory inorganic oxide carrier; said solid catalytic composition being formed by heating a composite mixture of the halide salt components of the fused salt complex to a temperature above the melting point of the composite, depositing the melted composite on the carrier surfaces and cooling of the carrier containing the melted composite to a temperature below the melting point of the fused salt complex.

4,045,510

METHOD FOR PROVIDING POLYMERS WITH DURABLE IMPROVED PROPERTIES

Robert B. Login, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sept. 24, 1975, Ser. No. 616,183
Int. Cl.[2] C08L *63/00, 77/00*
U.S. Cl. 260—830 P **4 Claims**

1. A method of providing fibers selected from the group consisting of polyamides, polyesters, and polyurethanes with a durable anti-stat coating which comprises

preparing a first polymer having (a) an oxyalkylene content of 20 to 95 weight percent and sufficient to render it hydrophilic and (b) a blocked pendant amino group, said first polymer being difunctional, chain-extending said first polymer by reaction with a difunctional compound selected from the group consisting of diacids, diesters of diacids, diisocyanates and diepoxides to form a chain-extended polymer containing plural blocked-amine functional groups,

hydrolyzing said chain-extended polymer to obtain a polymer containing a plurality of reactive amino groups,

curing the polymer so obtained by reaction with a quantity of a diepoxide effective to produce an anit-stat agent in the form of a non-tacky, definitely cured film, and applying said anti-stat agent to said fibers.

4,045,511

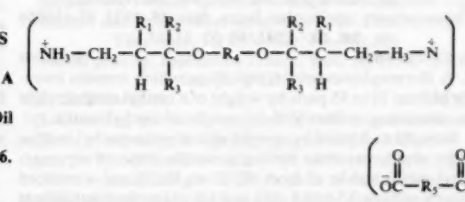
MINIMUM ENERGY PROCESS FOR PREPARING BLOCK COPOLYMERS OF POLYAMIDES

Stephen L. Nickol, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Nov. 8, 1976, Ser. No. 740,159
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—857 TW **6 Claims**

1. A process for forming a block polyamide copolymer comprising:

a. blending dry particles of a melt-spinnable polyamide and a dry salt selected from the group consisting of prepolyamides represented by the formula:



wherein

R_1, R_2 and R_3 are selected from the group consisting of H, C_1–C_{10} alkyls and C_3–C_{10} isoalkyls;

R_4 is selected from the group consisting of C_1–C_{10} alkylenes and C_3–C_{10} isoalkylenes; and

R_5 is selected from the group consisting of C_6–C_{14} arylenes, C_0–C_{10} alkylenes and C_3–C_{10} isoalkylenes;

wherein the salt content amounts to between from about 10 weight % to about 75 weight % of the total weight;

b. heating in an inert atmosphere resulting blend of the salt and the polyamide to a temperature in the range of between from the melting point of higher melting component to below about amide-interchange temperature of a mix of the melt spinnable polyamide and polyamide which would result from the polymerization of the salt; and

c. mixing the heated blend at the aforementioned temperature and in the inert atmosphere, until substantially all of the salt and the polyamide are converted to the block polyamide copolymer.

4,045,512

MELT BLENDING POLYAMIDE PROCESS

Robert M. Thompson, and Stephen L. Nickol, both of Wilmington, Del., assignors to Suntech, Inc., Wayne, Pa.

Filed Nov. 26, 1976, Ser. No. 745,320
Int. Cl.² C08L *77/00*
U.S. Cl. 260—857 TW **3 Claims**

1. In the process of melt-blending poly(4,7-dioxadecamethylene adipamide) and polycaprolactam wherein the improvement comprises continuing the melt blending until the clock copolymer is characterized in that the maximum amount of block copolymer recovered from an aqueous formic acid solution containing the dissolved block copolymer exceeds about 90.6 weight %.

4,045,513

ETHYLENE 2,6-NAPHTHALENE DICARBOXYLATED-ALKYLENE-2,5 DIBROMOTEREPHTHALATE FLAME-RETARDANT COPOLYESTERS

William N. Knopka, Wilmington, Del., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Filed Jan. 30, 1973, Ser. No. 328,045
Int. Cl.² C08L *67/00*
U.S. Cl. 260—860 **5 Claims**

1. A filament-forming random copolyester resin of at least 75 mol % of ethylene-2,6-naphthalene dicarboxylate units and at least 5 mol % up to 25 mol % of alkylene-2,5-dibromoterephthalate units wherein the alkylene radical has from 2 to 10 carbon atoms.

4,045,514

THERMOPLASTIC RESIN COMPOSITION COMPRISING METHYL METHACRYLATE RESINS AND A POLYCARBONATE

Shunji Iwahashi; Fukuichi Morizane, both of Toyonaka, and Yasuyuki Kato, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Division of Ser. No. 416,875, Nov. 19, 1973, Pat. No. 3,957,921. This application Jan. 30, 1976, Ser. No. 653,762
Claims priority, application Japan, Nov. 18, 1972, 47-116024
Int. Cl.² C08L *69/00, 33/12*
U.S. Cl. 260—873 **8 Claims**

1. A thermoplastic resin composition which consists essentially of from 10 to 95 parts by weight of a methyl methacrylate resin containing at least 80% by weight of methyl methacrylate, from 90 to 5 parts by weight of a styrene-methyl methacrylate copolymer resin having a weight ratio of styrene/-methyl methacrylate of from 80/20 to 70/30 and a reduced viscosity of from 0.5 to 3.5 dl/g in a 1% chloroform solution at 25° C. and a polycarbonate resin, the polycarbonate resin being present in an amount of from 5 to 150 parts by weight per 100 parts by weight of the methyl methacrylate resin and the styrene-methyl methacrylate copolymer resin.

4,045,515

FILM OF GOOD TEAR PROPERTY ON IMPACT

Tsutomu Isaka; Shuji Inoue, and Kunihiko Arakawa, all of Inuyama, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Division of Ser. No. 368,519, June 11, 1973, Pat. No. 3,952,073. This application Jan. 8, 1976, Ser. No. 647,630
Claims priority, application Japan, June 9, 1972, 47-57806
Int. Cl.² C08L *23/12, 23/08, 23/06;* B29G *27/00*
U.S. Cl. 260—897 A **13 Claims**

1. A biaxially stretched film having an excellent cutting property in the transverse direction, and sufficient break strength in the machine direction to resist breakage by impact in the machine direction, which comprises a mixture of polypropylene and at least one copolymer of ethylene with one or more other copolymerizable ethylenic monomers in a weight ratio of 40 : 60 to 95 : 5, the polypropylene having an isotactic index of not less than 85%, said film satisfying the following requirements:

1. $N_y - N_x = 6 \times 10^{-3}$ to 25×10^{-3} wherein N_x is the refractive index in the machine direction and N_y is the refractive index in the transverse direction;
2. $(N_x + N_y) \times 0.5 - N_z \leqq 0.012$ wherein N_z is the refractive index in the vertical direction and N_x and N_y are each as defined above;
3. the break elongation in the machine direction = 150 to 800%; and
4. no substantial necking is seen on the surface thereof, said film having been stretched at a draw ratio in the machine direction of from 1.05 to 2.0 and at a draw ratio in the transverse direction of not less than 4.

4,045,516

SOLID CURABLE POLYENE COMPOSITIONS CONTAINING A POLYTHIOL

Charles R. Morgan, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 330,818, Feb. 8, 1973, Pat. No. 3,925,320, which is a continuation-in-part of Ser. No. 250,554, May 5, 1972, abandoned. This application Nov. 24, 1975, Ser. No. 634,720
Int. Cl.² C08L *29/08*
U.S. Cl. 260—886 **9 Claims**

1. A solid curable composition useful for obtaining a solid cross-linked polythioether consisting essentially of:

1. a solid polyene which is the reaction product of a styrene-allyl alcohol copolymer and at least one reactive unsaturated monocarboxylic acid, said polyene containing at least 2 reactive carbon-to-carbon bonds per molecule; and
2. a liquid polythiol containing at least 2 thiol groups per molecule, the total combined functionality of (a) the reactive unsaturated carbon-to-carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than 4.

4,045,517

POLYACRYLIC HOT MELT ADHESIVES

John D. Guerin, Drexel Hill; Thomas W. Hutton, Doylestown; John J. Miller, Warminster, and Richard E. Zdanowski, Fort Washington, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 24, 1975, Ser. No. 634,815
Int. Cl.² C08L *33/14*
U.S. Cl. 260—901 **12 Claims**

1. A hot-melt adhesive composition comprising a blend or sequential polymerizate of:

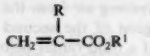
A. from about 5 to about 95 parts by weight of an addition copolymer having a Tg in the range of from 0° to −85° C. comprising:

1. from about 85 to about 99.5 parts by weight of a monomer or monomers selected from an alkyl ($C_{2\text{-}18}$) or alkoxyalkyl acrylate and
2. from about 0.5 to about 15 parts by weight of an ethyl-

enically unsatuated amine, carboxylic acid or sulfonic acid or mixtures thereof with

B. from about 5 to about 95 parts by weight of an additiion copolymer having a Tg in the range of from about 20° to about 150° C. comprising:

1. from about 95 to about 99.5 parts by weight of a monomer or monomers of the formula:



wherein R is hydrogen or methyl and R^1 is lower alkyl, lower cycloalkyl or isobornyl and

2. from about 0.5 to about 15 parts by weight of an ethylenically unsaturated amine, carboxylic or sulfonic acid or mixtures thereof,

said components being compatible, one of the polymers A and B having acid groups and the other having amine groups.

4,045,518

1,2-OXAPHOSPHOLANES

Helmut Zondler, Bottmingen; Emil Saladin, Augst, and Rudolf Kirchmayr, Munchenstein, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

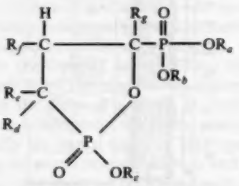
Continuation-in-part of Ser. No. 499,888, Aug. 23, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,455

Claims priority, application Switzerland, Sept. 7, 1973, 12890/73; May 21, 1974, 6981/74; July 29, 1974, 10465/74

Int. Cl.² C07F 9/15; C08K 5/53

U.S. Cl. 260—927 R **10 Claims**

1. A compound of the formula Ia



(Ia)

wherein each of R_a, R_b and R_c independently represents alkyl of 1 to 18 carbon atoms, haloalkyl with 2 to 18 carbon atoms, alkoxyalkyl having not more than 18 carbon atoms, alkenyl with 3 to 18 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, aralkyl with 7 to 15 carbon atoms aralkyl with altogether 7 to 15 carbon atoms which is substituted by halogen or alkoxy groups of 1 to 4 carbon atoms,

R_d represents hydrogen or methyl,

R_e represents hydrogen, alkyl with 1 to 8 carbon atoms, aryl with 6 to 10 carbon atoms or aryl with 6 to 10 carbon atoms which is susbstituted by halogen, alkyl or alkoxy groups with 1 to 4 carbon atoms, and with the proviso that when R_e is hydrogen or alkyl, none of R_a, R_b or R_c can be alkyl,

R_f represents hydrogen, methyl or phenyl, and

R_g represents alkyl with 1 to 8 carbon atoms, aryl with 6 to 10 carbon atoms or aryl with 6 to 10 carbon atoms which is substituted by halogen, alkyl or alkoxy with 1 to 8 carbon atoms.

4,045,519

PROCESS FOR PREPARING DIALKYLPHOSPHITES

William E. Wright, Farmington, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Sept. 16, 1976, Ser. No. 723,761

Int. Cl.² C07F 9/141; C10M 1/44

U.S. Cl. 260—976 **5 Claims**

1. A process for making a di-C_{1-4} alkylphosphite in high yield, said process comprising

a. forming a mixture of about 1.8–2.5 moles of a C_{1-4} alkanol and about 0.5 to 1.2 moles of water,

b. adding about one mole PCl_3 to said mixture and reacting at about 0° to 70° C.,

c. distilling dialkylphosphite from the reaction product of (b), leaving a distillation residue,

d. adding about 0.5 to 5 parts by weight of said alkanol to each part by weight of said distillation residue and heating the resultant mixture at 65° to 140° C., and

e. distilling additional dialkylphosphite from the final reaction product.

4,045,520

PROCESS FOR THE MANUFACTURE OF THIOFORMAMIDO-PHOSPHONO-ACETATES

Jacques Gosteli, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

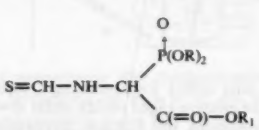
Filed Aug. 28, 1975, Ser. No. 608,798

Claims priority, application Switzerland, Sept. 11, 1974, 12353/74

Int. Cl.² C07F 9/40

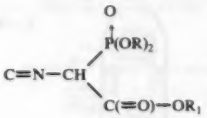
U.S. Cl. 260—985 **13 Claims**

1. A process for the manufacture of a thioformamidophosphono-acetate of the formula



(I)

wherein R represents lower alkyl, aryl or aryl-lower alkyl and R_1 represents a radical which protects the carboxyl group, characterized in that an isocyano compound of the formula $C{\equiv}N{-}CH_2{-}X_1$ (II) is reacted in the presence of a base with a compound of the formula $R_c{-}X_2$ (III), one of the radicals X_1 and X_2 representing a group of the formula $-C(=O)-OR_1$ (A) and the other representing a group of the formula $-P(\rightarrow O)(OR)_2$ (B) and R_c representing halogen or a reactive etherified or esterified hydroxyl group, and hydrogen sulphide is added on to the isocyano group of a resulting phosphono-isocyano-acetate of the formula



(IV)

4,045,521

CARBURETTOR ENRICHING DEVICE

Jean-Yves Lemonnier, and Lucien Chatelain, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault and Automobiles Peugeot, both of Paris, France

Filed Sept. 13, 1976, Ser. No. 722,356

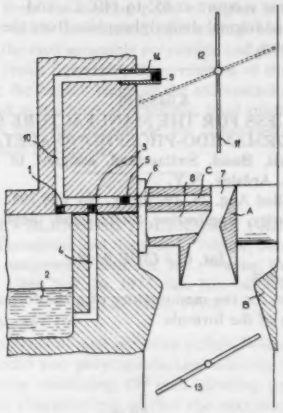
Claims priority, application France, Sept. 15, 1975, 75/28263

Int. Cl.² F02M 7/04

U.S. Cl. 261—41 R **2 Claims**

1. Enriching device for carburettors of internal combustion engines, comprising an aeration gaged orifice located at the upper portion of the float tank of the carburettor, a fuel gaged orifice communicating with the bottom of said fuel tank, and air/fuel mixture gaged orifice disposed in a passage interconnecting said aeration gaged orifice and said fuel gaged orifice and delivering said mixture at the level of the carburettor venturi, and an additional gaged orifice opening into the main passage of the carburettor, wherein said additional gaged ori-

fice is located at the end of a pipe section projecting to a predetermined extent into the main passage upstream of said venturi and slightly upstream of the closed position of the starter shutter, whereby said additional gaged orifice, according to the negative pressure discrepancy existing between its position and that of the mixture gaged orifice, will regulate the richness of the air/fuel mixture by performing successively as



an additional air inlet orifice for producing a leaner mixture passing through the mixture gaged orifice under low or moderate engine load conditions, this function decreasing gradually to zero, during the range of part-load operating conditions, and then as a gaged orifice supplying an additional output of air/fuel mixture, therefore as an enriching device, under high/load engine conditions.

4,045,522

ANIMAL WASTE TREATMENT SYSTEM

Joel L. Nafziger, R.R. 1, Hopedale, Ill. 61747

Division of Ser. No. 430,475, Jan. 3, 1974, Pat. No. 3,927,644.
This application Oct. 10, 1975, Ser. No. 621,392
Int. Cl.[2] F04F *5/02;* **F04B** *23/02*
U.S. Cl. 261—93 **5 Claims**

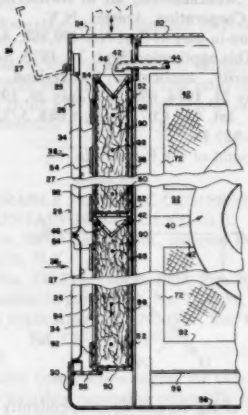
1. An aeration pump for use in a waste treatment system in which a slurry of animal waste and water is pumped and aerated, including the combination of a motor, a centrifugal fan driven by the motor, first and second pluralities of blades driven by the motor, a housing having a hollow interior in air receiving proximity to the centrifugal fan, a plurality of adjustable vents communicating with the hollow interior of the housing for venting a selected portion of air received by the hollow interior of the housing from the centrifugal fan to establish a desired level of aeration of the slurry, the bottom portion of the housing having a fluid inlet above the blades for directing the slurry into the first plurality of blades to pump the slurry, means for directing air from the hollow interior of the housing into the region of the second plurality of blades to aerate the slurry and a fluid outlet below the blades whereby the slurry is driven through the pump and aerated to a degree providing optimum bacterial action with a minimum foam production.

4,045,523

EVAPORATIVE COOLER WITH SUPERIMPOSED DISPOSABLE PAD ASSEMBLIES

Adam D. Goettl, P.O. Box 10036, Phoenix, Ariz. 85016

Filed June 9, 1975, Ser. No. 585,389
Int. Cl.[2] B01D *1/00*
U.S. Cl. 261—97 **2 Claims**



1. In an evaporative cooler the combination of: a frame; a sump pan secured to a lower portion of said frame; a plurality of superimposed foraminous evaporative cooler pad assemblies held by said frame above said sump pan; each pad assembly having an inlet side and an outlet side; means for forcing air through said pad assemblies in a direction from said inlet side toward said outlet side; each of said pad assemblies having an upper portion; a water trough in said upper portion; each water trough having a plurality of water distributor openings disposed and adapted to deliver water to an upper portion of a respective pad assembly therebelow; a foraminous water holding pad means below each trough; each of said pad assemblies having a lower portion provided with a water outlet opening; means disposed for delivering water into the trough of an uppermost pad assembly of said plurality; one of said pad assemblies being disposed such that said water outlet opening thereof is disposed above and adjacent to said trough one of said superimposed pad assemblies whereby water which tends to be forced by air towards said outlet side of each pad assembly drains from a respective water outlet opening into a respective water trough of a next lower one of said pad assemblies whereupon the respective water distributor openings thereof direct water into the upper portion of the respective water holding pad means therebelow; an inlet louver grill supported by said frame in spaced relation to said inlet sides of said pad; said louver grill having a lower channel portion; pan means having an upper edge portion supporting said lower edge portion of said louver grill; said louver grill having an upper

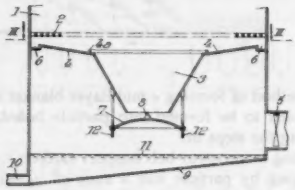
edge portion provided with an upwardly directed open channel portion; a pivoted access door pivotally mounted on an axis in spaced relation to said louver grill; said access door having an edge portion engageable in said upwardly directed channel portion at the upper edge of said louver grill and means for holding said access door downwardly such that it is held in engaged relation with said upwardly directed channel portion of said louver grill for holding the same in closed position.

4,045,524

INSTALLATIONS FOR WASHING A POLLUTED GAS

Paul Bornert, La Celle Saint-Cloud, France, assignor to Air-Industrie, France

Continuation of Ser. No. 451,681, March 15, 1974, abandoned. This application May 3, 1976, Ser. No. 682,595
Claims priority, application France, Mar. 20, 1973, 73.09949
Int. Cl.² B01D *47/00*
U.S. Cl. 261—112 **11 Claims**



1. Installation for washing a polluted gas comprising a vertically oriented trickling channel, the cross-section of which diminishes from above to below and which includes an opening at the lowermost end thereof, said opening being situated in a substantially horizontal plane, distributing means for causing washing liquid to trickle over the inner walls of said trickling channel in the form of a film so that the washing liquid detaches itself from the edge of the lower end of the trickling channel in the form of a sheet, at least one transverse wall situated in a substantially horizontal plane and extending across substantially the entire width of said opening, said transverse wall being arranged below the lower end of the trickling channel so that said sheet of liquid impinges directly thereon and having a continuous or discontinuous contour similar to the continuous or discontinuous contour of the lower end of said trickling channel, and means for circulating the polluted gas from above to below in said trickling channel such that said gas passes through said channel inwardly of said film of washing liquid and contacts and passes through said sheet of washing liquid, the distance between the uppermost major surface of said transverse wall and the lowermost end of the trickling channel being less than the width of the opening at the lowermost end of the trickling channel and said transverse wall cooperating with the lowermost end of the trickling channel to defined an area therebetween of such a shape and size that the sheet between the lower end of the trickling channel and said transverse wall is substantially free from tearing.

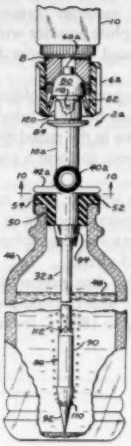
4,045,525

GAS HUMIDIFICATION APPARATUS

James A. Huggins, 551 W. Park Ave., Libertyville, Ill. 60048

Continuation of Ser. No. 480,843, June 19, 1974, abandoned. This application July 23, 1976, Ser. No. 708,115
Int. Cl.² B01F *3/04*; A61M *15/00*
U.S. Cl. 261—124 **13 Claims**

1. In a connector for a gas humidification apparatus that includes a container of the type having a sealed but pierceable closure, a body having a tubular portion and a gas supply tube axially slidable therein, said gas supply tube being of substantially smaller diameter than that of said tubular portion to form a chamber by the part of the bore of said tubular portion that is unoccupied by said gas supply tube, said gas supply tube having an outlet end with a diffuser thereon, cooperating means comprised of an exterior wall portion of the tube disposed about and spaced from an interior wall portion on said diffuser and including divider elements forming a series of individual passageways communicating with said chamber and running longitudinally of said diffuser and exteriorly of said



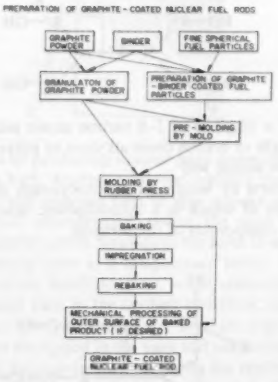
tube, said passageways also communicating with said outlet end and terminating in groups of gas discharge openings spaced longitudinally along said diffuser, said individual passageways defining gas flow channels from the gas supply tube to the interior of said container, and means on said diffuser for piercing the pierceable closure.

4,045,526

PROCESS FOR THE PREPARATION OF GRAPHITE-CLAD NUCLEAR FUEL RODS

Kazumi Iwamoto, Naka; Tutomu Tobita, Katsuta; Toshio Masuyama, and Hiroshi Yamazoe, both of Yokohama, all of Japan, assignors to Nippon Carbon Co., Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan

Filed Mar. 17, 1975, Ser. No. 559,298
Claims priority, application Japan, Mar. 22, 1974, 49-31552
Int. Cl.² G21C *21/02, 21/16*
U.S. Cl. 264—.5 **10 Claims**



1. A process for the preparation of tubular crack-free graphite-coated nuclear fuel compacts which comprises the steps of: coating fine particles of a nuclear fuel with a matrix material formed by mixing 100 parts by weight of graphite powder

with 20 to 35 parts by weight of a binder, to form matrix material-coated globules,

pre-molding the thus coated globules in a tube forming pre-molding machine to obtain a tubular fuel compact,

charging the thus obtained tubular fuel compact into the rubber mold of a rubber press molding machine,

filling a matrix material formed by mixing 100 parts by weight of graphite powder with 15 - 20 parts by weight of a binder, around the tubular fuel compact in the rubber mold,

conducting compression molding by compressing the side face of the thus obtained whole mass towards the axis of the whole mass in the radial direction thereof by means of the rubber press, to form a green, matrix material-coated fuel compact,

baking the thus formed green matrix material-coated compact at a temperature of up to 1800° C to thereby prepare the tubular crack-free graphite-coated nuclear fuel compacts, and if desired,

impregnating the thus prepared product with a resin and subjecting the impregnated product to rebaking at a temperature of up to 1800° C for further densification thereof.

4,045,527

POLYURETHANE AND COMPOSITE THEREOF

Eduard P. Babayan, Huntington Beach, and Michael H. Rourke, Santa Ana, both of Calif., assignors to Hitco, Irvine, Calif.

Continuation-in-part of Ser. No. 508,507, Sept. 23, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 654,956

Int. Cl.[2] **B29D** *3/02;* **C08G** *18/48, 18/26;* **B32B** *27/40*

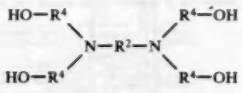
U.S. Cl. 264—46.7 **18 Claims**

1. A mobile, curable, reactive sealant, casting or potting composition consisting essentially of;

100 parts of a liquid prepolymeric polytetramethylene glycol polyol resin having a functionality from 1.7 to 3.5 and a molecular weight from 500 to 5,000;

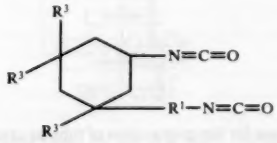
0.05 to 0.2 parts per 100 parts of glycol prepolymer resin (phr) of a metal salt curing catalyst selected from the group consisting of dibutyltindilaurate, zinc octoate, lead octoate and zirconium acetylacetonate; and

4–20 phr of a tetraalkanol amine curing agent of the formula:



where R^2 is alkylene of 2–6 carbon atoms and R^4 is selected from straight or branch chain alkylene or polyether containing 1–8 carbon atoms; and

50–70 parts by weight of a diisocyanate, at least 50% by weight of which is a cycloaliphatic isocyanate selected from compounds of the formula:



where R^1 is alkylene of 1–10 carbon atoms and R^3 is a lower alkyl of 1–8 carbon atoms.

4,045,528

METHOD FOR MAKING LAMINATED PARTICLEBOARD OF ORIENTED WOOD PARTICLES

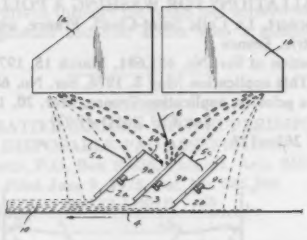
Urman Alexandrov Urmanov, Sofia, Bulgaria, assignor to DSO "Stara Planina", Sofia, Bulgaria

Division of Ser. No. 430,909, Jan. 4, 1974, Pat. No. 3,963,400. This application Jan. 10, 1975, Ser. No. 539,994

Claims priority, application Bulgaria, Apr. 25, 1973, 23438

Int. Cl.[2] **B29J** *5/00*

U.S. Cl. 264—69 **1 Claim**



1. A method of forming a multilayer blanket of wood particles adapted to be formed into particle board, said method comprising the steps of:

providing a conveyor belt support surface;

classifying by particle size a mass of wood particles and dispensing the classified particles above said surface in at least three streams, including a finest-particle stream, a fine particle stream and a coarse particle stream;

permitting said finest-particle stream to fall unintercepted on said surface;

intercepting each of the other particle streams upon a respective guide plate inclined downwardly and in the direction of displacement of said surface toward the latter for laying the particles of said other streams on said surface in respective layers, said plates being formed with mutually parallel downwardly extending channels adapted to receive the respective wood particles and orient them longitudinally as they meet said surface and the respective layers; and

vibrating said plates to align the successive particles in each of said channels.

4,045,529

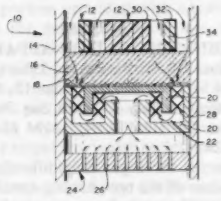
PROCESS FOR MAKING PRODUCER-COLORED FIBERS, YARNS, FILMS AND RELATED PRODUCTS

Bobby M. Phillips, and Dale R. Gregory, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,646

Int. Cl.[2] **D01F** *1/02;* **B01D** *47/00*

U.S. Cl. 264—75 **8 Claims**



1. Process for producing one or more colored filaments from a spinneret, the process comprising:

extruding from a source a flow of polymer to the spinneret, placing in the path of flow between the polymer flow and

the spinneret a dye solid or pigment solid having a predetermined shaped surface area for continuous exposure to the polymer flow, and

flowing the polymer into contact against the exposed surface of the dye solid or pigment solid and by such contact dissolving at a predetermined rate a predetermined portion of the dye solid or pigment solid into the polymer flow and with such predetermined portion providing a desired concentration of dye or pigment in the polymer flow.

4,045,530

METHOD OF MANUFACTURING SHATTERPROOF COMBUSTION TYPE PHOTOFLASH LAMPS

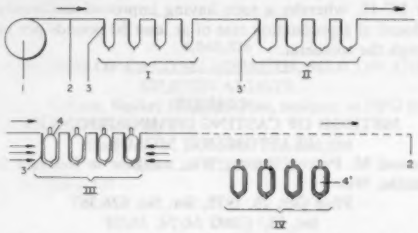
Hans Reiber, Augsburg, Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen m.b.H., Germany

Filed Oct. 5, 1976, Ser. No. 729,733

Claims priority, application Germany, Oct. 16, 1975, 2546403

Int. Cl.² B29C *17/04*

U.S. Cl. 264—92 **5 Claims**



1. The method of applying light-transmitting organic plastic shatterproof sleeves to the exterior of combustion-type photoflash lamps, which method comprises:

a. placing proximate mold means having a configuration corresponding to but slightly smaller than the dimensions of the lamps to be sleeved, a strip of light-transmitting organic plastic having a thickness of from about 0.3mm to about 0.8mm, a tough-plastic characteristic within the temperature range A of from about 160° C to about 200° C, a tough-elastic characteristic within the temperature range B of from about 90° C to about 125° C, and a freezing temperature T_E of from about 65° C to about 70° C; and heating said plastic strip to a temperature within said temperature range A and deep-drawing said heated organic plastic strip into said mold means to form organic plastic cups;

b. heating the formed organic plastic cups to a temperature within said temperature range B, and enlarging the heated organic plastic cups to a dimension slightly larger than the dimensions of the lamps to be sleeved, and freezing said enlarged organic plastic cups by reducing the temperature of said enlarged cups to less than said temperature T_E;

c. placing the lamps to be sleeved into said frozen cups;

d. heating said cups to cause same to shring-fit onto and sleeve said lamps; and

e. severing said sleeved lamps from residual organic plastic strip.

4,045,531

PROCESS FOR THE PRODUCTION OF CHIPBOARDS AND THE LIKE

Berndt Greten, Springe, Deister, Germany, assignor to bison-Werke Bahre & Greten GmbH & Co. KG, Germany

Filed June 24, 1975, Ser. No. 589,693

Claims priority, application Germany, June 28, 1974, 2431180

Int. Cl.² B29J *5/00*

U.S. Cl. 264—113 **10 Claims**

1. In the process for the production of particle boards which comprises:

a. intermixing particles with a heat-curable binder to cover the particles with said binder;

b. air screening the binder-covered particles to deposit a layer of the particles onto a support;

c. transporting the layer of particles into a first press;

d. prepressing the layer of particles within said first press to form a prepressed layer of particles;

e. transporting the prepressed layer of particles to a second press; and

f. pressing the prepressed layer of particles in said second press and heating the layer of particles within said second press to effect curing of said binder whereby the particles are bonded together to form a particle board;

the improvement which comprises

heating the air used in (b) for air-screening of the particles to provide more uniform temperature distribution through the thickness of the layer of particles transported to said first and second presses, the maximum temperature of the air being limited to avoid curing of the binder prior to compression of the particles in the first and second presses.

4,045,532

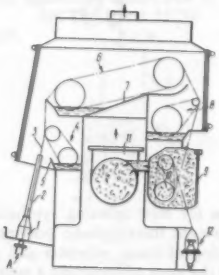
PROCESS OF PRODUCING VISCOSE YARN

Arkady Trofimovich Serkov, prospekt Mira, 13/19, kv. 20; Gennady Alfeevich Budnitsky, ulitsa Onezhskaya, 55, kv. 45, both of Moscow; Boris Matveevich Sokolovsky, ulitsa Pervomaiskaya, 27, kv. 71, Mytischi Moskovskoi oblasti, and Vyacheslav Kapitonovich Lezhnev, ulitsa Osipenko, 9, kv. 57, Moscow, all of U.S.S.R.

Filed Oct. 29, 1974, Ser. No. 518,793

Int. Cl.² D01F *2/06*

U.S. Cl. 264—196 **2 Claims**



1. A process of producing viscose yarn comprising providing a spinning bath, feeding a viscose solution through spinneret dies into said spinning bath to spin viscose yarn, finally regenerating and concurrently cooling the spun yarn, now carrying entrapped carbon bisulfide in the form of an emulsion, from said spinning bath at a temperature below the boiling point of the carbon bisulfide, then, while maintaining the finally regenerated yarn in the cooling condition, washing the yarn with water whereby some water, in addition to the carbon bisulfide, is also entrapped in the yarn and subjecting the thus-washed yarn to avivage treatment, drying the resulting yarn at an elevated temperature sufficient to concurrently remove both the entrapped water and carbon bisulfide from the yarn, and winding the resulting dried, carbon bisulfide-free yarn into a package.

4,045,533

METHOD OF MANUFACTURING PRESTRESSED REINFORCED CONCRETE ARTICLES

Viktor Vasilievich Mikhailov, ulitsa Chkalova, 25, kv. 14; Semen Lvovich Litver, Bolshaya Pirogovskaya, 37/43, Korpus A, kv. 32, and Alexandr Konstantinovich Karasev, ulitsa Georgiu Dezh, 2/I, kv. 192, all of Moscow, U.S.S.R.

Continuation of Ser. No. 56,948, July 21, 1970, abandoned. This application Jan. 15, 1973, Ser. No. 323,823

Int. Cl.[2] B28B *1/00, 11/00*

U.S. Cl. 264—228 4 Claims

1. A method of manufacturing prestressed reinforced concrete articles, consisting essentially of the following operations: moulding the articles from a concrete containing a stressing cement mixture of Portland cement with an added expanding component consisting essentially of a mixture of calcium sulphate, calcium aluminates and calcium oxide; curing the articles until they acquire a stripping strength; stripping said articles, subjecting said articles to hydrothermal treatment under water at a temperature which is not below 50° C for 1–4 hours, and subsequently keeping said articles in cold water for 3–4 days.

4,045,534

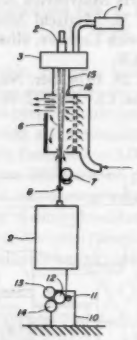
PROCESS FOR MELT-SPINNING SYNTHETIC FIBERS

William Bernard Fisher; Dong Wha Kim, both of Chester; Orin Wyatt Norwood, Richmond, all of Va.; John Walter Showers, Raleigh, N.C.; Eugene Addison Swanson, Disputanta, and Gene Clyde Weedon, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 473,260, May 24, 1974, Pat. No. 3,936,253. This application Oct. 28, 1975, Ser. No. 626,156

Int. Cl.[2] B29C *25/00;* D01D *3/00*

U.S. Cl. 264—237 5 Claims



1. In a process for melt spinning synthetic fibers from a high-molecular weight thermoplastic polymer selected from the group consisting of linear polyester and polyamide polymers, comprising the steps of supplying a melt of said polymer at a temperature below the spinning temperature, heating the melt to spinning temperature immediately prior to filament formation, extruding the molten synthetic polymer downwardly through a spinneret having a plurality of extrusion orifices into a gaseous medium and cooling the polymer to form filaments and drawing the filaments at draw ratios of at least 4, the improvement comprising: extruding the molten synthetic polymer at a rate of at least 50 pounds per hour downwardly through a spinneret having a plurality of extrusion orifices; advancing the extruded filaments downwardly through a substantially stationary column of air having a height of 0.5 to 2 feet and a temperature of 100° to 330° C. immediately below the spinneret, the average distance between adjacent filaments immediately below the spinneret being at least 0.24 inch; continuously advancing the filaments downwardly through a top zone of a quenching chamber wherein the filaments are cooled with cooling air laterally introduced into the path of the filaments at a temperature not above 35° C., said top zone of said quenching chamber having 2 to 5 horizontal sections, intended to provide guided travel of the cooling air transverse to the downward movement of said filaments; then continuously advancing the filaments downwardly through a middle zone of said quenching chamber wherein the filaments are cooled with cooling air laterally introduced into the path of the filaments not above 35° C., said cooling air passing upwardly to a vent opening, thereby contacting said filaments countercurrent to the downward movement of said filaments; and then continuously advancing the filaments downwardly through a bottom zone of said quenching chamber wherein the filaments are cooled with cooling air laterally introduced into the path of the filaments at a temperature not above 35° C., said cooling air passing downwardly to a vent opening, thereby contacting said filaments cocurrent to the downward movement of said filaments; said quenching chamber having a height of at least 60 inches and said filaments being contacted with air at a volumetric rate of 200 to 700 cubic feet of air per pound of filaments entering the quenching chamber, the temperature of the filaments being reduced to not over 55° C., whereby a yarn having improved uniformity is produced at a production rate of at least 50 pounds per hour through the spinneret.

4,045,535

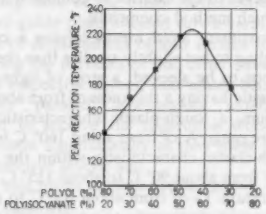
METHOD OF CASTING COMPOSITIONS IN ELASTOMERIC MOLDS

Raymond M. Putzer, Racine, Wis., assignor to Resment Inc., Racine, Wis.

Filed Oct. 28, 1975, Ser. No. 626,367

Int. Cl.[2] C08G *14/14, 18/08*

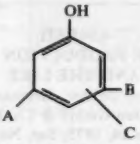
U.S. Cl. 264—313 18 Claims



1. A method of molding a substantially bubble free object with a mold release value of at least about 10 inches of mercury and with a critical surface tension for wetting of at least about 35 dynes/cm. that undergoes a change in volume of less than about 1%, comprising: introducing into an elastomeric mold an admixture substantially free from water and entrapped air, of a phenolic polyol, a polyisocyanate and a curing catalyst wherein:

I. said polyol is:

a. an organic solvent soluble benzylic ether polyol which contains benzylic ether group and which comprises a condensation polymer of a phenol having the general formula:



wherein A, B, and C are hydrogen, hydrocarbon radicals, oxyhydrocarbon radicals or halogen, condensed with an aldehyde having the general formula R'CHO wherein R' is hydrogen or a hydrocarbon radical of one to eight carbon atoms in the presence of catalytic concentrations of a metal ion, or

b. a methylol-terminated phenolic polyol which comprises a resole polyol which is organic solvent soluble;

II. said hardener component is a liquid polyisocyanate containing at least two isocyanate groups;

III. said curing agent is a base having a pK_b value in the range from between about 7 and about 11 and is present in an amount equal to 0.01 to 10.0 weight percent based on the weight of the polyol, and

IV. the components are mixed in the mold, the peak reaction temperature is maintained below about 235° F. the composition is maintained free from foaming and phase inversion is obtained by:

a. controlling the ratio of polyol to polyisocyanate from between about 1:2 and 2:1,

b. selecting solvents with flash points above the peak reaction temperature, and

c. maintaining a catalyst concentration sufficient to avoid adverse secondary reactions; the cured casting is removed from the mold by applying a vacuum from between about 10 and about 25 inches of Mercury to the mold cavity.

4,045,536

METHOD OF CASTING BISMUTH, SILICON AND SILICON ALLOYS

John F. Wallace, Shaker Heights, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 8, 1975, Ser. No. 594,184
Int. Cl.² B22D *21/00*
U.S. Cl. 264—327 **4 Claims**

1. In a method of preparing castings of materials having solidification expansion, which materials are chosen from the group consisting of bismuth, silicon and silicon alloys containing in excess of 92 atomic percent silicon, wherein the molten material is cooled to establish a casting thereof in a container, the improvement comprising cooling said material in a rigid, elongated, vertically disposed container having a higher rate of heat transfer our of said container in lower portions thereof then in higher portions thereof while applying heat to the top of said casting as said casting solidifies whereby to maintain a core and a portion of the top of the casting molten and in liquid communication with each other until the casting is substantially solidified.

4,045,537

PROCESS FOR RECOVERING SODA AND ALUMINA VALUES FROM RED MUD

Kizhakke G. Hrishikesan, Little Rock, Ark., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 593,109, July 3, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 730,952
Int. Cl.² C01F *7/08*
U.S. Cl. 423—119 **6 Claims**

3. A recovery process for recovering available soda and alumina values from a high iron-Bayer red mud, comprising:

A. adding from 0.33 to about 3 moles of carbon in a carbon-containing material per mole of Fe_2O_3 to said high iron-Bayer red mud to form a mixture;

B. subjecting said mixture to a conventional lime-soda-sinter operation to form a sinter; and

C. without prior separation of iron from said sinter, extracting said sinter with an NaOH solution to recover said available soda and alumina values.

4,045,538

CATALYTIC OXIDATION OF VINYL CHLORIDE

Edward J. Sare, Clinton, and Jerome M. Lavanish, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 636,231, Nov. 28, 1975, abandoned. This application Sept. 1, 1976, Ser. No. 719,535
Int. Cl.² B01D *53/34*
U.S. Cl. 423—240 **19 Claims**

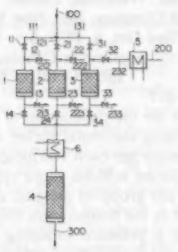
1. A method for reducing the vinyl chloride content of a vinyl chloride-containing gas stream, which comprises contacting the vinyl chloride of said gas stream with an oxidizing amount of oxygen-containing gas at temperatures of from 20° to 300° C. in the presence of hydrated metal oxide catalyst selected from the group consisting of copper (II) oxide, manganese (IV) oxide, manganese (III) oxide, manganese (II, III) oxide, and mixtures of such manganese oxides with copper (II) oxide or copper (I) oxide for a time sufficient to reduce said vinyl chloride content of the gas stream, said temperature being such as to inhibit water induced loss of catalyst activity.

4,045,539

PROCESS FOR DECONTAMINATING GAS CONTAINING RADIOACTIVE IODINE

Mikio Hirano; Masaki Takeshima; Toru Saito, and Atou Shimozato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 31, 1975, Ser. No. 546,192
Claims priority, application Japan, Feb. 1, 1974, 49-12778
Int. Cl.² B01D *53/34*
U.S. Cl. 423—240 **15 Claims**

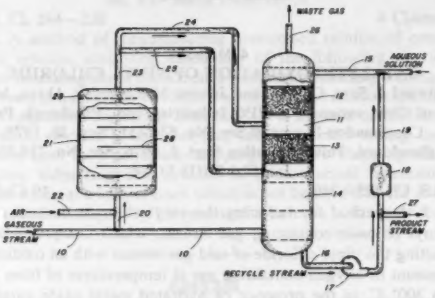


1. A process for decontaminating a vent gas containing radioactive iodine and radioactive methyl iodide, which comprises (1) chemically adsorbing iodine onto an activated carbon layer, (2) retaining the adsorbed iodine in a tightly sealed state for a predetermined period of time after the adsorption of iodine reaches a saturated state thereby decaying the radioactivity of the adsorbed iodine, (3) desorbing the adsorbed iodine by heating when decay of the radioactivity is completed thereby regenerating the activated carbon, (4) heating the vent gas passing out of said activated carbon layer during iodine adsorption, and (5) passing the heated vent gas through another activated carbon packed layer thereby decaying the radioactivity of the methyl iodide.

4,045,540
PROCESS FOR THE SYNTHESIS OF AMMONIUM NITRITE

Richard Ross Hertzog, Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 10, 1976, Ser. No. 665,584
Int. Cl.[2] C01B *21/50*
U.S. Cl. 423—385 5 Claims



1. In a process for producing ammonium nitrite by the absorption of a gas containing nitric oxide, nitrogen dioxide, oxygen and at least 65 percent by volume of inert gas in an absorption system with an aqueous absorbing solution containing a basically reacting ammonium compound selected from the group consisting of ammonium carbonate, ammonium bicarbonate, ammonium hydroxide and mixtures thereof, employing entering gas with at least 2.0 mol ratio of nitric oxide:-nitrogen dioxide and employing absorbing solution having normality of at least 0.01 with respect to the basically reacting ammonium compound, the improvement which comprises adding supplemental nitrogen dioxide to said gas being absorbed in the absorption system in amount sufficient to maintain a nitric oxide:nitrogen dioxide mol ratio between 0.8 and 1.0 in the exiting gas, said supplemental nitrogen dioxide being added to said gas when the absorption of nitrogen oxides is 50 to 95 percent complete based on the nitrogen oxides in the entering gas.

4,045,541
CARBONYLATION PROCESS

David L. Mercer, Wainfleet, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

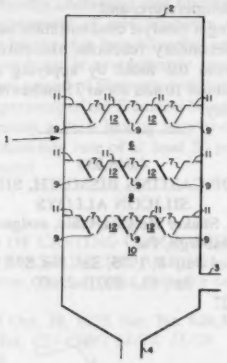
Filed Oct. 6, 1975, Ser. No. 620,157
Claims priority, application Canada, June 25, 1975, 230113
Int. Cl.[2] C01G *1/04*
U.S. Cl. 423—417 5 Claims

1. A process for the production of nickel carbonyl wherein a mass comprising elemental nickel intimately mixed with at least one half mole per each 100 moles of nickel of at least one metal which forms sulfides more readily than nickel and is selected from the group of metallic iron, metallic copper and metallic cobalt in the temperature range of up to about 200° C is confined in a pressure retaining enclosure having walls chemically resistant to carbonylation and sulfidation and having a gas entry port and a gas exit port, mixing in said enclosure or in an extension thereof having walls chemically resistant to carbonylation and sulfidation a first gas stream containing carbon monoxide and devoid of hydrogen sulfide and a second gas stream containing hydrogen sulfide and devoid of carbon monoxide to provide a mixed gas stream containing about 0.01% to about 0.5% hydrogen sulfide based upon volume of carbon monoxide, reacting said mixed gas stream with said mass in said enclosure while maintaining the pressure in said enclosure at about 1 to 70 atmospheres absolute, while maintaining the temperatures in said enclosure at about 40° C to about 200° C and while maintaining an excess of metal which forms sulfides more readily than nickel to form nickel carbonyl and non-nickel sulfides and to remove hydrogen sulfide from said gas stream and withdrawing nickel carbonyl along with other volatile carbonyl from said enclosure through said gas exit port in a gas stream devoid of sulfur components.

4,045,542
PRODUCTION OF CHLORINE DIOXIDE

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 532,666, Dec. 13, 1974, Pat. No. 3,975,505. This application Aug. 6, 1976, Ser. No. 712,283
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.[2] C01B *11/02, 7/04;* C01D *3/04*
U.S. Cl. 423—478 14 Claims



1. In a process for continuously generating a mixture containing chlorine dioxide, chlorine and an alkali metal salt wherein

a. an alkali metal chlorate and hydrochloric acid are continuously reacted in proportion to generate chlorine dioxide and chlorine;
b. the temperature is maintained from about 50 to about 100° C;
c. The acidity of the reaction solution is maintained within the range of about 0.05 to about 2.5 normal;
d. chlorine dioxide and chlorine produced by said reaction is withdrawn from the reactor;
e. water is removed and alkali metal salt of said hydrochloric acid is crystallized in the form of an aqueous slurry containing minor amounts of chlorate, and acid values;

The improvement which comprises:

continuously passing the slurry containing alkali metal salt crystals into the top of a separatory column, in a downward flow;

countercurrently passing a stream of water continuously upwardly through said column at a rate sufficient to effect washing of the downwardly flowing crystals whereby chlorate, chloride and acid values recovered therefrom are continuously and substantially completely returned to the reaction of (a) aforesaid; and continuously removing an aqueous slurry of substantially pure alkali metal chloride salt crystals from the bottom of said separatory column.

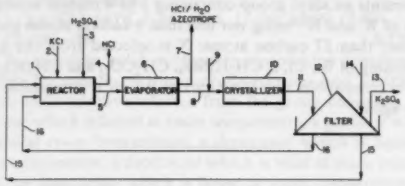
4,045,543
PRODUCTION OF POTASSIUM SULFATE AND HYDROGEN CHLORIDE

John B. Sardisco, Shreveport, La., assignor to Pennzoil Company, Shreveport, La.

Filed Nov. 12, 1975, Ser. No. 630,954
Int. Cl.[2] C01B *7/08;* C01D *5/02*
U.S. Cl. 423—482 6 Claims

1. A method for the production of potassium sulfate and

potassium hydrogen sulfate which comprises initially reacting potassium chloride and sulfuric acid in an aqueous medium at a temperature of about 65° to 120° C. under conditions to form hydrogen chloride and removing a portion of the hydrogen chloride from the reaction zone by gaseous evolution, thereafter subjecting the resulting aqueous solution to azeotropic distillation at temperatures in the range of from 90° to 110° C., and removing an HCl/water azeotrope until the remainder of



the hydrogen chloride has been removed, and form a resulting aqueous slurry, thereafter adding to the resulting aqueous slurry an amount of water which is substantially equivalent to the amount of water removed with the azeotrope to again form an aqueous solution, cooling the aqueous solution to a temperature of about 30°-75° C., to allow a solid precipitate to crystallize from solution, and recovering the solid which comprises a mixture of potassium sulfate and potassium hydrogen sulfate.

4,045,544

PROCESS FOR THE PREPARATION OF FERROMAGNETIC CHROMIUM DIOXIDE

David Wyckoff Williston, Newark; Lewis Clinton Bancroft, and Dale Murray Hiller, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1976, Ser. No. 719,167
Int. Cl.[2] C01G *37/02*
U.S. Cl. 423—607 **8 Claims**

1. In a process for the preparation of ferromagnetic chromium dioxide which comprises heating a reaction mixture comprising one or more chromium oxides wherein the chromium has an average valence other than +4 in the presence of water to a temperature greater than 250° C. and under a pressure of at least 200 atmospheres, and cooling and drying the resulting ferromagnetic chromium dioxide, the improvement comprising:

heating said reaction mixture to form a rigid mass of chromium dioxide, in an annulus closed at one end and defined by inner and outer walls coaxially aligned each having a thermal coefficient of expansion different from that of said rigid mass of chromium dioxide, said inner wall defining a hollow column open at both ends, and

cooling both said chromium dioxide and said annulus to cause one of said walls to separate partially from contact with said rigid mass of chromium dioxide forming a ring-like escape path for water vapor.

4,045,545

MANUFACTURE OF COMPLEX HYDRIDES

Eugene C. Ashby, Atlanta, Ga., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 221,075, Jan. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 751,862, July 30, 1958, abandoned. This application Jan. 29, 1975, Ser. No. 545,114
Int. Cl.[2] C01B *6/24*
U.S. Cl. 423—644 **8 Claims**

1. The process for the manufacture of alkali metal aluminum tetrahydrides in solid, readily filterable form comprising pressure hydrogenating at a temperature of about 50° C to 250° C, a mixture consisting essentially of aluminum, the hydride of an alkali metal, and an organic liquid reaction medium stable at reaction conditions, said medium being selected from the class consisting of aliphatic hydrocarbons and aromatic hydrocarbons, said pressure hydrogenating being carried out in the presence of a catalyst selected from the group consisting of alkyl compounds of metals of Group I-A, II-A and III-A of the periodic table, said catalyst being in proportions of up to about 5 weight percent of the reaction medium thereby forming an alkali metal aluminum tetrahydride consisting of aluminum, the alkali metal and hydrogen in solid form and recovering said solid.

4,045,546

PROCESS FOR THE PREPARATION OF HYDROGEN

Anthony A. duPont, 8 Georgeff Road, Rolling Hills, Calif. 90274

Division of Ser. No. 613,236, Sept. 15, 1975, Pat. No. 4,010,249. This application Aug. 6, 1976, Ser. No. 712,272
Int. Cl.[2] C01B *1/08, 13/02*
U.S. Cl. 423—657 **2 Claims**

1. A process for generating hydrogen which comprises the following steps: (a) reacting cadmium metal with steam to form cadmium oxide (CdO) and hydrogen (H_2); (b) reacting iodine (I_2) with cadmium oxide (CdO) to form cadmium iodide ($OCdI_2$) and cadmium iodate ($Cd(IO_3)_2$); (c) decomposing the cadmium iodate by the introduction of heat to form the corresponding oxide (CdO), and iodine and oxygen gas; (d) replacing the cadmium in the cadmium iodide (CdI_2) with lead (Pb) by feeding gaseous cadmium iodide into the bottom of a column of liquid lead and taking gaseous cadmium (Cd) off the top of the column; (e) replacing the lead in the resulting lead iodide (PbI_2) with gallium (Ga) to form gallium iodide (GaI_3) and lead (Pb); (f) decomposing the gallium iodide by the introduction of heat to recover the original gallium; and (g) recycling the recovered gallium into step (e) of the process.

4,045,547

FABRICATION OF SOFT CONTACT LENS AND COMPOSITION THEREFOR

Albert R. Le Boeuf, Sturbridge, and William R. Grovesteen, West Dudley, both of Mass., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 526,022, Nov. 21, 1974, Pat. No. 3,978,164. This application Dec. 17, 1975, Ser. No. 641,466
Int. Cl.[2] A61K *9/70*
U.S. Cl. 424—28 **3 Claims**

1. A shaped eye bandage for medicament delivery which can be cut and shaped in the dry form and thereafter hydrated in a buffered saline solution to form a bandage having from about 45% to 65% water after hydration, said bandage in dry form consisting essentially of polymerized random graft copolymers containing from about 67.2% to about 79.3% HEMA; from about 14.25% to about 35% PVP; from about 0.1% to about 4.04% EDMA; from about 0.1% to about 2.5% MA; from about 0.1% to about 5.0% water; from about 0 to about 4 ppm, based on the weight of HEMA monomer, of HQ inhibitor; and from about 50 to 250 ppm, based on the weight of HEMA monomer, of MEHQ inhibitor; said composition having been polymerized in a three-stage polymerization process comprising:

A. A first stage, using only a low temperature polymerization initiator, with substantially all the oxygen having been removed from the polymerization mix prior to and during the polymerization reaction; the initial polymerization reaction being conducted at from 23° C. to about 30° C., for from about 16 to about 36 hours, with the heat of the reaction continuously absorbed to control the reaction exotherm; followed by

B. A second stage, wherein the product of (A) is heated to a temperature of from about 40° C. to about 80° C. in the absence of any additional polymerization initiator, without

control of the reaction exotherm, for from 2 to 6 hours; followed by

C. A third stage polymerization, wherein the product of (B) is heated to a temperature of from about 105° C. to about 125° C., in the absence of any additional polymerization initiator, for from 24 to 36 hours;

said bandage containing an opthalmologically acceptable medicament incorporated therein.

4,045,548

AEROSOL ANTIPERSPIRANT CONTAINING EMOLLIENTS

Wilmer Louis Luedders, Cincinnati, and Thomas Andrew Wetzel, Green Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 442,299, Feb. 13, 1974, abandoned, which is a continuation of Ser. No. 190,303, Oct. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 59,694, July 30, 1970, abandoned. This application Apr. 25, 1975, Ser. No. 571,812

Int. Cl.[2] A61K *7/34, 7/36, 7/38*

U.S. Cl. 424—47 **8 Claims**

1. A powder aerosol antiperspirant composition consisting essentially of:

A. from about 1.0% to about 12% by weight of a finely divided powder antiperspirant compound that is insoluble in the composition, said compound being based on salts selected from the group consisting of aluminum chlorhydroxide, aluminum chloride, aluminum sulfate, aluminum oxychloride, aluminum oxysulfate, zirconyl hydroxychloride zirconium oxychloride, zinc sulfate and zinc sulfocarbolate;

B. from about 0.1% to about 1% by weight of a suspending agent for the antiperspirant compound, which suspending agent is a hydrophobic clay that swells in organic solvents;

C. from about 1.0% to about 15% by weight of a hydrophobic emollient-carrier liquid which is a multiple ester of an organic acid wherein said ester contains from about 12 to about 16 carbon atoms, and said ester has a ratio of ester groups to carbon atoms of from about 0.125 to about 0.214 and wherein said ester has a solubility in water of from about 0.0005% to about 0.1% at 30° C.; and

D. from about 70.7% to about 93.9% of anhydrous liquefiable propellant gas under pressure to produce an aerosol spray.

4,045,549

SULFONIUM SALT SUBSTANTIVE SUNSCREEN COMPOSITIONS

John Fred Gerecht, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

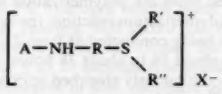
Division of Ser. No. 148,158, May 28, 1971, Pat. No. 3,864,474, which is a continuation-in-part of Ser. No. 820,280, April 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 492,316, Oct. 1, 1965, abandoned. This application Jan. 6, 1975, Ser. No. 538,688

The portion of the term of this patent subsequent to Feb. 4, 1992, has been disclaimed.

Int. Cl.[2] A61K *7/44*

U.S. Cl. 424—60 **19 Claims**

1. A sunscreening composition comprising from 0.1% to 25% by weight of a substantive sulfonium salt sunscreening agent represented by the formula



wherein A is a substituted benzene sunscreening moiety having a prominent spectral absorption peak within the range of 250–400 millimicrons and selected from the group consisting of 4-aminobenzoyl, 4-nitrobenzoyl, 2-hydroxybenzoyl, 4-(2'hydroxybenzoyl) benzoyl, 4-(2'-benzotriazoly)-2-hydroxybenzoyl, 4-aminobenzenesulfonyl, 4-nitrobenzene sulfonyl, 2-hydroxybenzenesulfonyl, 4-(2'-hydroxybenzoyl)benzenesulfonyl and 4-(2'benzotriazolyl)-2-hydroxybenzenesulfonyl; R represents an alkylene of from 2 to 18 carbon atoms; R' represents an alkyl group containing from 7 to 26 carbon atoms; R'' represents an alkyl group containing 1 to 4 carbon atoms, the sum of R' and R'' being not less than 9 carbon atoms and not greater than 27 carbon atoms; X is selected from the group consisting of Br, Cl, I, $CH_2H_5SO_4$, CH_3CO_2, and CH_3SO_4; and a skin compatible, non-toxic carrier which is compatible with said agent.

4,045,550

SKIN PROTECTIVE COMPOSITIONS

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 46,561, June 15, 1970, which is a continuation-in-part of Ser. No. 696,509, Jan. 9, 1968, Pat. No. 3,630,934, which is a continuation-in-part of Ser. No. 613,095, Feb. 1, 1967, abandoned. This application Feb. 4, 1974, Ser. No. 439,119

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.[2] A61K *7/02, 7/06*

U.S. Cl. 424—70 **17 Claims**

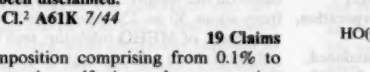
1. A skin protective lotion or creme consisting essentially of a skin irritation reducing effective amount of a protective agent and a non-aqueous emollient, humectant or surfactant; said lotion or creme capable of reducing skin irritation compared to said lotion or creme without protective agent when applied to the skin prior to contact with a skin irritant; said protective agent being dispersible in said lotion or creme; said protective agent containing two polar groups which are separated by a chain of at least 15 atoms a majority of which are carbon; said protective agent selected from the group consisting of:

1. esters and polyesters of the polymerized fatty acid product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid, said product containing 2 to 4 carboxyl groups; and an alcohol which is

a. polyoxyalkylene ether containing 2 to 30 oxyalkylene units in which the alkylene radical contains 2 to 4 carbon atoms;

b. a condensation product of alkylene oxide having 2 to 4 carbon atoms and polyamine having 2 to 4 amino groups and containing 2 to 8 carbon atoms in an aliphatic, cycloaliphatic or aromatic group; or

c. a condensation product of ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol, having the general formula:



wherein *a* is 1 to 150
b is 15 to 70 and
c is 1 to 150; and

2. esters and polyesters of the hydrogenated polymerized product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid, said hydrogenated polymerized product containing 2 to 4 carboxyl groups; and an alcohol which is (a), (b) or (c) above.

4,045,551
SUBLIMABLE AROMATIC COMPOSITIONS

Yasuhiko Ueno, Kawanishi; Yoshito Saeki, Suita; Takuya Akiyama, Nagaokakyo, and Masao Fujita, Amagasaki, all of Japan, assignors to Ogawa & Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 424,313, Dec. 13, 1973, abandoned. This application July 2, 1975, Ser. No. 592,531
Claims priority, application Japan, Jan. 19, 1973, 48-9362; July 11, 1973, 48-66508
Int. Cl.[2] A61K *7/46;* A61L *13/00;* A01N *17/02*
U.S. Cl. 424—76 8 Claims

1. An aromatic, solid, sublimable composition consisting of 80–99% by weight of triisopropyl-s-trioxane and 1–20% by weight of an additive selected from the group consisting of a perfume which is liquid at room temperature, a perfume which is solid at room temperature, a deodorant which is liquid at room temperature, a deodorant which is solid at room temperature, an insecticide which is liquid at room temperature, an insecticide which is solid at room temperature and a mixture thereof.

4,045,552
PROTEASE-FREE PROTEINS, AND METHODS OF MANUFACTURING AND USING THE SAME

Carl Kutzbach; Alfred Arens, and Gunter Schmidt-Kastner, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 13, 1975, Ser. No. 604,086
Claims priority, application Germany, Sept. 7, 1974, 2442995
Int. Cl.[2] A61K *37/48*
U.S. Cl. 424—94 10 Claims

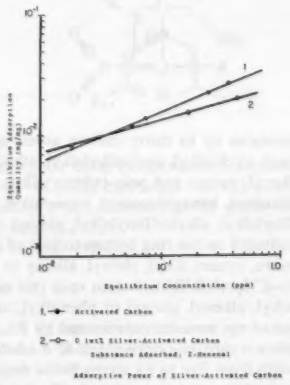
1. A method of removing protease from kallikrein, comprising contacting a solution of the kallikrein with a carrier-bound water-insoluble polypeptide protease inhibitor that does not bind to said kallikrein, and recovering a protease-free kallikrein.

8. Kallikrein having an activity of about 1000 to 1300 KU/mg and a protease content of about 0.004 to about 0.011 U/mg produced by the method of claim 1.

4,045,553
METHOD OF TREATING SILVER IMPREGNATED ACTIVATED CARBON

Nobuo Mitsumori; Chikahiro Takeda, and Hideichi Miyasako, all of Kyoto, Japan, assignors to Nippon Shinyaku Company, Limited, Kyoto, Japan

Filed Feb. 26, 1975, Ser. No. 553,244
Int. Cl.[2] B01D *15/06;* A61L *13/04*
U.S. Cl. 424—132 1 Claim



1. The method of restoring the sterilization and purification properties of silver impregnated activated carbon which comprises subjecting spent silver impregnated activated carbon to the action of steam until said properties are restored.

4,045,554
PROCESS FOR PRESERVING WOOD CHIPS DURING STORAGE

Edward L. Springer, Madison, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 30, 1975, Ser. No. 618,187
Int. Cl.[2] A01N *13/00;* A61L *13/00*
U.S. Cl. 424—164 2 Claims

1. A method for preserving wood substance, brightness and tall oil in stored wood chips comprising treating said chips with a biocidally effective amount of an aqueous solution containing 2.0 percent sodium bisulfite and:

a. 0.35 percent resorcinol; or

b. 0.30 percent p-nitrophenol.

4,045,555
METHOD FOR THE PHOTOSTABILIZATION OF POLYHYDROXYLATED STEROLS AND STABILIZED BIOLOGICAL INSECTICIDAL PRODUCT OBTAINED THEREBY

Giorgio Ferrari; Luigi Canonica, both of Milan, and Bruno Danieli, Cesano Maderno (Milan), all of Italy, assignors to Dauten S.A., Switzerland

Filed Sept. 26, 1972, Ser. No. 292,295
Claims priority, application Italy, Sept. 29, 1971, 29276/71
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—174 3 Claims

1. A biological insecticide formulate comprising

an insect metamorphosis hormone which deteriorates in light, and

a stabilizing photoprotective compound mixed with said hormone in an amount ranging between a lower limit of 0.005 grams per 100 parts by weight of the final formulate, and an upper limit in which said compound equals the weight of said hormone, and selected from the group consisting of benzotriazoles, and substituted phenylglioxylic acids and their salts.

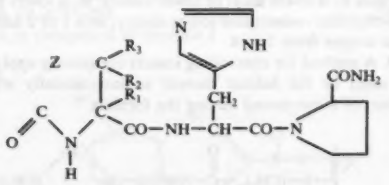
4,045,556
DIPEPTIDE DERIVATIVES, PROCESS FOR MANUFACTURE AND PHARMACEUTICAL PREPARATIONS

Eberhard Schwertner, Heinrichsallee 55, 51 Aachen, and Siegfried Herrling, Dohlenweg 33, 519 Stolberg, both of Germany

Filed Oct. 16, 1975, Ser. No. 622,804
Claims priority, application Germany, Oct. 16, 1974, 2449167; June 21, 1975, 2527723
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 31 Claims

1. The dipeptide derivative of the formula

(I)

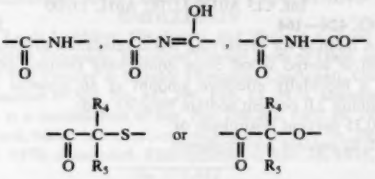


wherein R_1 and R_2 are the same or different, each one is hydrogen or alkyl having 1 to 3 carbon atoms or R_1 and R_2 considered together represent an additional bond between the carbon atoms to which R_1 and R_2 are linked;

R_3 is a hydrogen or alkyl of 1 to 3 carbon atoms and

Z is a divalent structure which completes the ring to a 5-or 6-membered ring, the divalent structure together with the

group to which it is attached being one of the following:



wherein R_4 and R_5 are the same or different, each one being a hydrogen or alkyl of 1 to 3 carbon atoms, hydrates thereof, and the pharmaceutically acceptable salts of these dipeptides with pharmaceutically acceptable acids.

21. The pharmaceutically acceptable composition which comprises a compound of claim **1** defined in formula I in a therapeutically effective amount, and a pharmaceutically acceptable carrier.

26. A method of causing a psychostimulating effect, with thyrotropin releasing hormone activity on the central nervous system which comprises administering to a warm-blooded patient subject to a depressive state, a therapeutically effective amount of a composition of claim **21.**

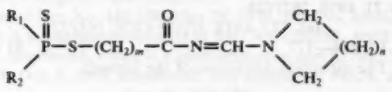
4,045,557

CERTAIN FORMAMIDINE DITHIOPHOSPHATES AND PHOSPHONATES AND THEIR USE AS INSECTICIDES

Hsiao-ling Lam, and Eugene G. Teach, both of El Cerrito, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

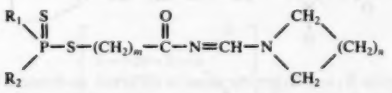
Filed Feb. 12, 1976, Ser. No. 657,438
Int. Cl.[2] A01N *9/36;* **C07D** *211/06*
U.S. Cl. 424—200 **43 Claims**

1. A compound having the formula



in which R_1 is lower alkyl or lower alkoxy, R_2 is lower alkoxy, or methylthio - substituted lower alkoxy, *m* is 1 or 2 and *n* is 0 or an integer from 1 to 4.

23. A method for controlling insects comprising applying to the nsect or the habitat thereof an insecticidally effective amount of a compound having the formula



in which R_1 is lower alkyl or lower alkoxy, R_2 is lower alkoxy or methylthio-substituted lower alkoxy, *m* is 1 or 2 and *n* is 0 or any integer from 1 to 4.

4,045,558

PILOCARPINE SALTS

Robert L. Smith, and Ta-Jyh Lee, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rayway, N.J.

Filed Oct. 8, 1975, Ser. No. 620,623
Int. Cl.[2] A61K *31/62, 31/672, 31/415;* **C07D** *405/06*
U.S. Cl. 424—232 **5 Claims**

1. Pilocarpinium 2,5-dihydroxybenzoate.

5. The method of reducing intraocular pressure in the eye which comprises topically administering to an eye of a host having raised intraocular pressure an effective amount of pilocarpinium 2,5-dihydroxybenzoate.

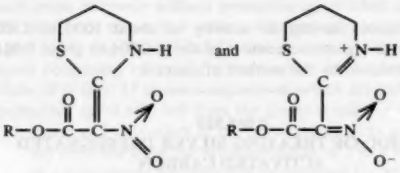
4,045,559

USE AS INSECTICIDES OF ESTERS OF NITRO(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)ACETIC ACIDS

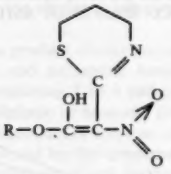
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 554,371, March 3, 1975, Pat. No. 3,962,234, which is a continuation-in-part of Ser. No. 468,125, May 8, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,982
Int. Cl.[2] A01N *9/00, 9/12*
U.S. Cl. 424—246 **2 Claims**

1. A method of killing insects which comprises contacting them with an insecticidally effective amount of a resonance hybrid in which the significant forms are represented by the formulae



and the enol form represented by the formula



wherein R contains up to thirty carbon atoms and is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, alkadienyl, haloalkyl, haloalkenyl, mono- and poly-(alkoxy)alkyl, alkylthioalkyl, phenylthioalkyl, benzylthioalkyl, cyanoalkyl, hydroxyalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, phenyl or phenalkyl or either substituted on the ring by one to two of one or more of halogen, nitro, cyano, alkyl, phenyl, alkoxy or phenoxy; is aminoalkyl, $—CH_2—NR^3R^4$, wherein *m* is one or two, R^3 is alkyl, cycloalkyl, alkenyl, phenyl or phenalkyl, and R^4 is hydrogen or one of the moieties represented by R^3; or is $—CH_2—R^5$, wherein *n* is zero, one or two, and R^5 is a heteromonocyclic moiety with from five to six atoms in the ring, containing carbon atoms and one to two oxygen (—O—), sulfur (—S—) or nitrogen atoms (=N— or —NH—) bonded to carbon in the ring.

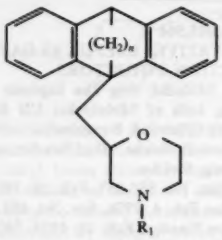
4,045,560

2-MORPHOLINE CONTAINING METHANO OR ETHANO ANTHRACENE COMPOUNDS

Makoto Sunagawa; Hiromi Sato; Junki Katsube, all of Osaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed July 7, 1976, Ser. No. 703,128
Claims priority, application Japan, July 7, 1975, 50-83870
Int. Cl.[2] C07D *265/30;* A61K *31/535*
U.S. Cl. 424—248.4 7 Claims

1. A compound of formula:



wherein R_1 is hydrogen, C_1–C_4 alkyl, C_3–C_5 alkenyl, phenyl(C_1–C_4)alkyl or (C_3–C_6)cycloalkyl(C_1–C_4)alkyl and *n* is 1 or 2, or a non-toxic salt thereof.

7. A method for treatment of mental depression which comprises administering to a human an effective amount of at least one compound according to claim 1.

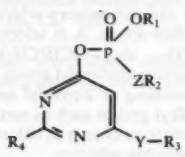
4,045,561

PESTICIDAL PYRIMIDINYL PHOSPHORUS ESTERS

Herbert Mühle; Karlheinz Milzner, both of Basel, and Fritz Reisser, Therwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 597,473, July 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,526, March 19, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,446
Claims priority, application Switzerland, May 26, 1975, 6724/75; July 31, 1975, 10002/75; Jan. 6, 1976, 49/76; Mar. 23, 1973, 4253/73; Sept. 17, 1973, 13328/73
Int. Cl.[2] C07D *239/34, 239/38;* A01N *9/12, 9/22*
U.S. Cl. 424—251 42 Claims

1. A compound of the formula:



wherein

R_1 and R_2, are each, independently, alkyl-(C_1–C_6),

R_3 is alkyl (C_1–C_6), cycloalkyl (C_3–C_8), phenyl phenyl substituted by 1 to 3 members of the group chlorine, bromine and alkyl (C_1–C_3),

R_4 is a radical $-NR_5R_6$

wherein

R_5 and R_6 are each independently, hydrogen or alkyl (C_1–C_6),

or R_5 and R_6 together with the nitrogen atom to which they are bound form piperdino, morpholino or pyrrolidino,

or a radical $—WR_7$

wherein

W is oxygen or sulphur and

R_7 is alkyl (C_1–C_6)

Q and Y are each, independently, sulphur or oxygen and

Z is oxygen, sulphur or a radical

wherein R_8 is hydrogen or alkyl (C_1–C_5).

30. An insecticidal composition comprising an insecticidally effective amount of a compound of claim 1, in association with an insecticide carrier or diluent.

4,045,562

LISURIDE AND PHYSIOLOGICALLY ACCEPTABLE SALTS THEREOF TO ACHIEVE PSYCHIC ENERGIZER EFFECTS

Turan M. Itil, Nyack, N.Y., and Werner Martin Herrmann, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed May 21, 1976, Ser. No. 688,559
Claims priority, application Germany, May 22, 1975, 2523026
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.[2] A61K *31/48, 31/475*
U.S. Cl. 424—261 6 Claims

1. A method for the treatment of psychic disturbances manifested by

a. behaviorally disturbed and/or hyperkinetic children suffering from loss of concentration and memory and learning difficulties,

b. adolescents and adults with so-called neurasthenic symptomatology with at least one of the following symptoms: loss of interest, loss of drive and activity, loss of energy and functional capacity, loss of concentration and learning ability, and

c. geriatric patients with loss of interest, loss of drive and activity, loss of energy and functional capacity, loss of concentration and learning ability combined with severe disturbances in mental function,

which comprises administering to the affected patient a daily dosage of from 300 μg. to 1,000 μg. of N-D-6-methyl-8-isoergolenyl-N',N'-diethylurea or a physiologically acceptable acid addition salt thereof effective to ameliorate the psychic disturbance.

4,045,563

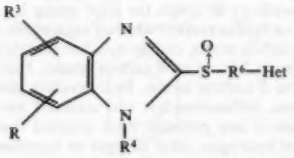
SUBSTITUTED 2-[PYRIDYLALKYLENESULFINYL]-BENZIMIDAZOLES WITH GASTRIC ACID SECRETION INHIBITING EFFECTS

Peder Bernhard Berntsson, Molndal; Stig Ake Ingemar Carlsson; Lars Erik Garberg, both of Molnlycke; Ulf Krister Junggren, Pixbo; Sven Erik Sjostrand, Kungsbacka, and Gunhild Wika von Wittken Sundell, Askim, all of Sweden, assignors to AB Hassle, Goteborg, Sweden

Filed Nov. 11, 1975, Ser. No. 630,916
Int. Cl.[2] A61K *31/44;* C07D *235/12*
U.S. Cl. 424—263 65 Claims

1. A compound of formula I

(I)

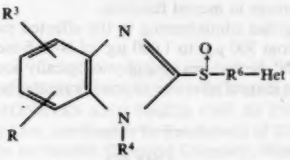


or a therapeutically acceptable salt thereof in which R is selected from the group consisting of hydrogen, alkyl having up

to four carbon atoms, halogen of the group consisting of fluoro, iodo, bromo and chloro, cyano, carboxy, carboxyalkyl in which the alkyl group has up to 4 carbon atoms, carboalkoxy in which the alkyl group has up to 4 carbon atoms, carboalkoxyalkyl wherein each of the alkyl groups has up to 4 carbon atoms, carbamoyl, carbamoylalkyl in which the alkyl group has up to 4 carbon atoms, hydroxy, alkoxy having up to 5 carbon atoms, hydroxyalkyl having up to 7 carbon atoms, trifluoromethyl and alkanoyl having up to 4 carbon atoms in any position; R^3 is selected from the group consisting of hydrogen, alkyl having up to four carbon atoms, halogen of the group consisting of fluoro, iodo, bromo and chloro, carboxy, carboxyalkyl in which the alkyl group has up to 4 carbon atoms, carboalkoxy in which the alkyl group has up to 4 carbon atoms, carboalkoxyalkyl wherein each of the alkyl groups has up to 4 carbon atoms, carbamoyl, carbamoylalkyl in which the alkyl group has up to 4 carbon atoms, hydroxy, alkoxy having up to 5 carbon atoms, hydroxyalkyl having up to 7 carbon atoms, trifluoromethyl and alkanoyl having up to 4 carbon atoms in any position; R^4 is selected from the group consisting of hydrogen, alkyl straight or branched chain having up to 5 carbon atoms, alkanoyl having up to 4 carbon atoms, carbamoyl, alkylcarbamoyl wherein the alkyl group may be straight or branched and has up to 4 carbon atoms, dialkylcarbamoyl wherein each alkyl group has up to 4 carbon atoms, alkylcarbonylmethyl wherein the alkyl group has up to 4 carbon atoms, alkoxycarbonylmethyl wherein the alkyl group has up to 4 carbon atoms, and alkylsulphonyl wherein the alkyl group has up to 4 carbon atoms; R^6 is a straight or branched alkyl group having 1 to 4 carbon atoms, wherein at most one methylene group is present between S and Het, and Het is pyridyl, which may be further substituted preferably in the 3 to 5 position with lower alkyl groups such as methyl, ethyl or propyl or with halogen substituents such as chloro and bromo.

7. A method of inhibiting gastric acid secretion by administering to mammals, including man, suffering from gastric acid secretion disturbances a compound of the formula I

(I)



or a therapeutically acceptable salt thereof in which R is selected from the group consisting of hydrogen, alkyl having up to four carbon atoms, halogen of the group consisting of fluoro, iodo, bromo and chloro, cyano, carboxy, carboxyalkyl in which the alkyl group has up to 4 carbon atoms, carboalkoxy in which the alkyl group has up to 4 carbon atoms, carboalkoxyalkyl wherein each of the alkyl groups has up to 4 carbon atoms, carbamoyl, carbamoylalkyl in which the alkyl group has up to 4 carbon atoms, hydroxy, alkoxy having up to 5 carbon atoms, hydroxyalkyl having up to 7 carbon atoms, trifluoromethyl and alkanoyl having up to 4 carbon atoms in any position; R^3 is selected from the group consisting of hydrogen, alkyl having up to four carbon atoms, halogen of the group consisting of fluoro, iodo, bromo and chloro, carboxy, carboxyalkyl in which the alkyl group has up to 4 carbon atoms, carboalkoxy in which the alkyl group has up to 4 carbon atoms, carboalkoxyalkyl wherein each of the alkyl groups has up to 4 carbon atoms, carbamoyl, carbamoylalkyl in which the alkyl group has up to 4 carbon atoms, hydroxy, alkoxy having up to 5 carbon atoms, hydroxyalkyl having up to 7 carbon atoms, trifluoromethyl and alkanoyl having up to 4 carbon atoms in any position; R^4 is selected from the group consisting of hydrogen, alkyl straight or branched chain having up to 5 carbon atoms, alkanoyl having up to 4 carbon atoms, carboalkoxy wherein the alkyl group has up to 4 carbon atoms, carbamoyl, alkylcarbamoyl wherein the alkyl group may be straight or branched and has up to 4 carbon atoms, dialkylcarbamoyl wherein each alkyl group has up to 4 carbon atoms, alkylcarbonylmethyl wherein the alkyl group has up to 4 carbon atoms, alkoxycarbonylmethyl wherein the alkyl group has up to 4 carbon atoms, and alkylsulphonyl wherein the alkyl group has up to 4 carbon atoms; R^6 is a straight or branched alkyl group having 1 to 4 carbon atoms, wherein at most one methylene group is present between S and Het, and Het is pyridyl, which may be further substituted preferably in the 3 to 5 position which lower alkyl groups such as methyl, ethyl and propyl or with halo substituents such as chloro and bromo, in amount sufficient to inhibit such suffering.

4,045,564

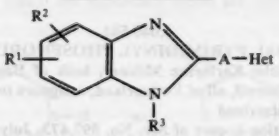
BENZIMIDAZOLE DERIVATIVES USEFUL AS GASTRIC ACID SECRETION INHIBITORS

Peder Bernhard Berntsson, Molndal; Stig åke Ingemar Carlsson; Lars Erik Garberg, both of Molnlycke; Ulf Krister Junggren, Pixbo; Sven Erik Sjöstrand, Kungsbacka, and Gunhild Wika von Wittken Sundell, Askim, all of Sweden, assignors to AB Hassle, Goteborg, Sweden

Continuation-in-part of Ser. No. 550,637, Feb. 18, 1975, abandoned. This application Feb. 4, 1976, Ser. No. 655,246
Claims priority, application Sweden, Feb. 18, 1974, 7402101
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—263 **12 Claims**

1. A method of inhibiting gastric acid secretion by administering to mammals, including man, suffering from gastric acid secretion disturbances, in an effective amount, a compound of the formula I

(I)



wherein R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen, alkyl having up to seven carbon atoms, halogen, nitro, carboxy, carboalkoxy, wherein the alkyl group has up to four carbon atoms, carboalkoxyalkyl wherein each of the two alkyl groups has up to four carbon atoms, hydroxy, alkoxy having up to five carbon atoms, hydroxyalkyl having up to seven carbon atoms, and alkanoyl having up to four carbon atoms, in any position; R^3 is selected from the group consisting of hydrogen, alkanoyl having up to four carbon atoms, and carboalkoxy wherein the alkyl group has up to four carbon atoms; A is selected from the group consisting of $—SCH_2—$ and $—SCH(CH_3)—$, whereby the S atom is bound to the benzimidazolyl group; and Het is selected from the group consisting of 2-pyridyl and 2-pyridyl substituted with lower alkyl groups such as methyl, ethyl and propyl, and halogen substituents such as chloro and bromo, or its therapeutically acceptable salts.

4,045,565

9-HYDROXY ELLIPTICINE

Jean Bernard Le Pecq; Claude Paoletti, both of Paris, and Nguyen Dat-Xuong, Antony, all of France, assignors to Etablissement Public dit: Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Oct. 29, 1974, Ser. No. 518,875
Claims priority, application France, Oct. 29, 1973, 73.38416
Int. Cl.[2] C07D *471/04;* A61K *31/395*
U.S. Cl. 424—263 **8 Claims**

1. 9-hydroxy ellipticine or 9-hydroxy-5, 11-dimethyl-(6H)-pyrido [4,3-b] carbazole.

8. A method of cardiac treatment, which comprises using a therapeutically active amount of 9-hydroxy ellipticine.

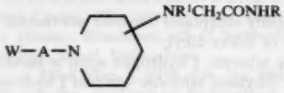
4,045,566
PIPERIDYL-GLYCYLAMIDE DERIVATIVES

John Leheup Archibald, Windsor, and John Lambert Jackson, Royston, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Apr. 14, 1976, Ser. No. 676,950
Claims priority, application United Kingdom, Apr. 15, 1975, 15394/75
Int. Cl.[2] C07D *401/06, 211/56*
U.S. Cl. 424—267 10 Claims

1. A compound having the general formula:

(Ia)



wherein W represents a phenyl or 3-indolyl radical, either of which radicals may be unsubstituted or substituted by halogen, lower alkyl, lower alkoxy or hydroxy; A represents a lower alkylene radical, an oxo lower alkylene radical or a hydroxy lower alkylene radical; R represents a phenyl radical optionally substituted by halogen, lower alkyl, lower alkoxy or hydroxy, or a cycloalkyl radical of 5 to 7 carbon atoms radical; R^1 represents hydrogen or a lower alkyl radical; or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

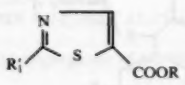
10. A hypotensive pharmaceutical composition comprising a therapeutically effective amount of a compound as claimed in claim 1 or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof together with a pharmaceutically acceptable carrier.

4,045,567
2-ALKYL-5-THIAZOLE-CARBOXYLIC ACID DERIVATIVES IN HYPOLIPEMIANT COMPOSITIONS

Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel Uclaf, France

Continuation of Ser. No. 557,289, March 11, 1975, abandoned, which is a division of Ser. No. 431,881, Jan. 9, 1974, Pat. No. 3,882,110, which is a continuation of Ser. No. 244,909, April 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 842,017, July 15, 1969, abandoned. This application Feb. 27, 1976, Ser. No. 662,122
Claims priority, application France, June 11, 1969, 69.19339
Int. Cl.[2] A61K *31/425*
U.S. Cl. 424—270 12 Claims

1. A hypolipemiant composition comprising an effective amount of at least one 2-alkyl-5-thiazolecarboxylic acid derivative of the formula



wherein R is a member selected from the group consisting of hydrogen, an alkali-metal, triethylammonium, diisopropylammonium, diethylammonium, ethanolammonium, collidinium, morpholinium, piperidinium, alkyl having 1 to 10 carbon atoms, benzyl, the alkyl residue of an alkylheterocyclic alcohol the alkyl residue of which contains 1 to 6 carbon atoms and of which the heterocyclic residue is selected from the group consisting of furyl, thienyl and pyridyl, α-glyceryl, diethylaminoethyl, diethylaminopropyl and dipropylaminoethyl, and R'_1 is a linear alkyl of 1 to 12 carbon atoms, and a major amount of a pharmaceutical carrier.

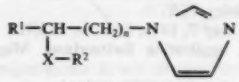
4,045,568
DERIVATIVES OF SUBSTITUTED N-ALKYL IMIDAZOLES

Keith A. M. Walker, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 599,439, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 665,025
Int. Cl.[2] A61K *31/415;* C07D *233/60*
U.S. Cl. 424—273 55 Claims

1. A compound of the formula

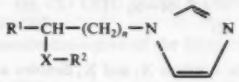
(I)



wherein R^1 is straight chain alkyl of from 1 to 12 carbon atoms, R^2 is halo-substituted phenyl or benzyl, X is oxygen or sulfur, n is an integer of from 1 to 8; and the antimicrobial acid addition salts thereof.

53. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing, or subject to attack by, fungi, bacteria or protozoa, an effective amount of a compound of the formula

(I)



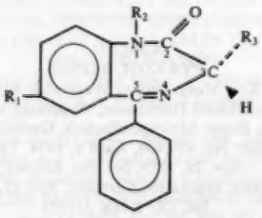
wherein (a) R^1 is straight chain alkyl of from 1 to 12 carbon atoms, R^2 is halo-substituted phenyl or benzyl, X is oxygen or sulfur and n is an integer of from 1 to 8, or (b) R^1 is unsubstituted phenethyl or styryl, R^2 is straight chain alkyl of from 1 to 12 carbon atoms, X is oxygen or sulfur and n is 1, or an antimicrobial acid addition salt thereof, or a composition containing same as an active ingredient.

4,045,569
OPTICALLY ACTIVE 1,4-BENZODIAZEPINES AND PROCESS FOR USE AS A TRANQUILIZER

Franjo Kajfez; Nikola Blazevic, and Vitomir Sunjic, all of 18 via Motta, 6830 Chiasso, Switzerland

Division of Ser. No. 493,145, July 30, 1974, Pat. No. 3,998,811, which is a continuation-in-part of Ser. No. 234,645, March 14, 1972, abandoned. This application July 29, 1976, Ser. No. 709,858
Claims priority, application Switzerland, Mar. 17, 1971, 3868/71
Int. Cl.[2] A61K *31/33, 31/40*
U.S. Cl. 424—274 1 Claim

1. A method for tranquilizing a patient which comprises administering to the patient an effective amount of an optically active compound of the formula



having an asymmetric carbon atom in position 3, said asymmetric carbon atom having the S configuration wherein R_1 is

selected from the group consisting of hydrogen, halogen, nitro, and trifluoromethyl, R_2 is selected from the group consisting of hydrogen and C_{1-4} lower alkyl and R_3 is selected from the group consisting of C_{1-4} lower alkyl, hydroxy C_{1-4} lower alkyl, phenyl, hydroxyphenyl, benzyl, hydroxybenzyl, and 3'-methyleneindolyl.

4,045,570
HETEROCYCLIC S-IMINO-S-OXIDES

Gunther Dorhofer, Allschwil; Roland Heckendorn, Arlesheim; Erich Schmid, Basel; Angelo Storni, Rheinfelden, and Armin Zust, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

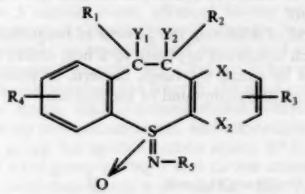
Filed May 7, 1975, Ser. No. 575,319

Claims priority, application Switzerland, May 10, 1974, 6423/74

Int. Cl.² C07D *337/14*

U.S. Cl. 424—275 **14 Claims**

1. A heterocyclic S-imino-S-oxide of the formula I



(I)

in which one of the symbols X_1 and X_2 denotes a direct bond and the other denotes the vinylene group —CH=CH— or the epithio radical —S—, Y_1 and Y_2 conjointly denote an additional bond or one of the symbols denotes hydrogen and the other denotes hydrogen or, conjointly with the symbol R_1 or R_2, which is present on the same carbon atom, denotes the oxo radical, one of the symbols R_1 and R_2 denotes hydrogen or lower alkyl and the other denotes hydrogen or lower alkyl or, conjointly with the symbol Y_1 or Y_2, which is present on the same carbon atom, denotes the oxo radical, or, if Y_1 and Y_2 conjointly denote an additional bond, also denotes lower alkoxy, and R_3 and R_4 independently of one another denote hydrogen, halogen up to atomic number 35, lower alkyl, lower alkoxy or trifluoromethyl and R_5 denotes hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

11. An oral anticonvulsive preparation comprizing an anticonvulsively effective amount of a compound according to claim **1**, wherein X_1, X_2, Y_1, Y_2, R_1, R_2, R_3, R_4 and R_5 have the meanings defined in claim **1**, or a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutical carrier.

13. A method for inducing an anticonvulsant action in a warm-blooded animal in need of treatment comprising peroral administration to said animal of an anticonvulsively effective amount of a compound according to claim **1**, wherein X_1, X_2, Y_1, Y_2, R_1, R_2, R_3, R_4 and R_5 have the meanings defined in claim **1**, or of a pharmaceutically acceptable acid addition salt thereof.

4,045,571
PYRAZOL-5-ONES

Eike Moller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

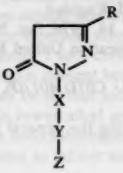
Division of Ser. No. 459,408, April 9, 1974. This application Nov. 20, 1975, Ser. No. 633,601

Claims priority, application Germany, Apr. 17, 1973, 2319278

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 P **42 Claims**

1. A pharmaceutical composition useful for effecting diuresis and saluresis in humans and animals and for treating hypertension in humans and animals which comprises a diuretic, saluretic or antihypertensive amount of a pyrazol-5-one of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen or lower alkyl;

X is methylene wherein 1 hydrogen atom is substituted by lower alkyl, ethylene, ethylene wherein 1 hydrogen atom on one of the carbon atoms is substituted by lower alkyl or ethylene wherein 1 hydrogen atom on each of the two carbon atoms is substituted by lower alkyl;

Y is a direct bond; and

Z is aryl of 6 to 10 carbon atoms unsubstituted or substituted by:

a. 1 or 2 of the same or different substituents selected from the group consisting of halogen. trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, and alkenoxy of 2 to 4 carbon atoms;

b. cycloalkyl of 5, 6 and 7 carbon atoms, or cycloalkenyl of 5, 6 or 7 carbon atoms;

c. nitro;

d. nitro, and 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkenoxy of 2 to 4 carbon atoms, halogen and trifluoromethyl; or

e. a fused, saturated or unsaturated 5-, 6- or 7-membered ring; in combination with a pharmaceutically acceptable nontoxic inert diluent or carrier.

4,045,572
3-AMINO-1-PHENYL-1H,5H,-BENZO-2,4-THIAZEPINES

John Bernard Bream, Bern, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

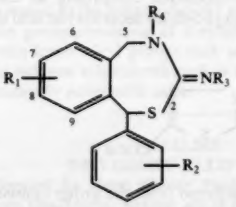
Filed May 26, 1976, Ser. No. 690,210

Claims priority, application United Kingdom, May 28, 1975, 23290/75; May 28, 1975, 23291/75; Jan. 14, 1976, 1909/76

Int. Cl.² C07D *281/02*

U.S. Cl. 424—275 **69 Claims**

1. A compound of formula I,



wherein

R_1 and R_2 are independently hydrogen, halogen, trifluoromethyl, lower alkoxy or lower alkyl,

R_3 is hydrogen, lower alkyl, lower hydroxyalkyl, or phenylalkyl of 7 to 10 carbon atoms, wherein the phenyl ring is unsubstituted or mono-substituted, or independently disubstituted, by halogen, lower alkyl, lower alkoxy, amino, lower alkylamino or di(lower alkyl)amino, and

R_4 is hydrogen,

in free base form or in pharmaceutically acceptable acid addition salt form thereof.

2. A pharmaceutical composition useful in treating depression or heart rhythm disorder comprising a therapeutically effective amount of a compound of claim **1** in association with a pharmaceutical carrier or diluent.

3. A method of treating depressions in animals which comprises administering a therapeutically effective amount of a compound of claim **1** to an animal in need of such treatment.

4,045,573

2,3-DIHYDROBENZOFURAN-2-ONE DERIVATIVES

Annemarie Closse, Binningen; Walter Haefliger, Basel, and Daniel Hauser, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Mar. 5, 1976, Ser. No. 664,235

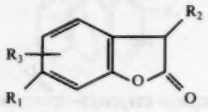
Claims priority, application Switzerland, Mar. 12, 1975, 3129/75; July 24, 1975, 9678/75

Int. Cl.[2] **A01N** *9/28;* **C07D** *307/83*

U.S. Cl. 424—279 **25 Claims**

1. A compound of formula I,

I



wherein

R_1 is alkyl of 1 to 10 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or phenyl,

R_2 is hydrogen or lower alkyl, and

R_3 is halogen, nitro, lower alkyl, methylthio, hydroxy, lower alkoxy, alkanoyloxy of 1 to 4 carbon atoms or alkanoylamino of 1 to 4 carbon atoms, with the proviso that when R_3 is in the 5 position, and R_1 and R_3 are identical and signify a straight alkyl chain of 1 to 5 carbon atoms, R_2 is lower alkyl.

25. A method of treating oedemas, inflammations and arthritis in animals which comprises administering a therapeutically effective amount of a compound of claim **1** to an animal in need of such treatment.

4,045,574

D-HOMO-20-KETOPREGNANES

Ulrich Kerb; Rudolf Wiechert; Klaus Kieslich; Karl Petzoldt; Helmut Wachtel; Dieter Palenschat; Reinhard Horowski; Gert Paschelke, and Wolfgang Kehr, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

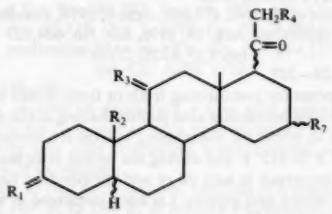
Filed Nov. 29, 1974, Ser. No. 528,328

Claims priority, application Germany, Nov. 30, 1973, 2360443; Sept. 19, 1974, 2445161

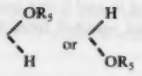
Int. Cl.[2] **A01N** *9/14;* **A61K** *31/255;* **C07C** *49/26*

U.S. Cl. 424—303 **23 Claims**

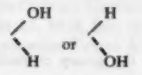
1. A D-homo-20-ketopregnane of the formula



wherein R_1 is an oxygen atom



in which R_5 is hydrogen or the acyl radical of a hydrocarbon carboxylic or sulfonic acid of up to 8 carbon atoms; R_2 is hydrogen or methyl; R_3 is an oxygen atom,



or two hydrogen atoms; R_4 is hydrogen, hydroxy, or hydrocarbon acyloxy of up to 15 carbon atoms; and R_7 is hydroxy or lower-alkanoyloxy.

4,045,575

THIOAMIDE PESTICIDES

Robert J. G. Searle, Sittingbourne, and Clive B. C. Boyce, Herne Bay, both of England, assignors to Shell Oil Company, Houston, Tex.

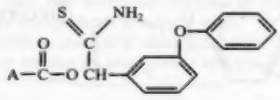
Filed Mar. 9, 1976, Ser. No. 665,220

Claims priority, application United Kingdom, Mar. 11, 1975, 10070/75

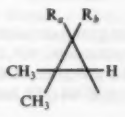
Int. Cl.[2] **C07C** *153/067;* **A01N** *9/12*

U.S. Cl. 424—305 **11 Claims**

1. A thioamide derivative of the formula



wherein A represents a cyclopropyl group of the formula



wherein R_a and R_b individually represents an alkyl group of 1 to 6 carbon atoms, a halogen atom of atomic number 9 to 35 or R_a and R_b together represent an alkylene group of up to 6 carbon atoms or R_a represents hydrogen and R_b represents an alkenyl or haloalkenyl group of up to 6 carbon atoms.

7. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of a thioamide as claimed in claim **1** and at least one carrier or surface-active agent.

4,045,576

ANTI-INFLAMMATORY METHODS USING 2-AMINO-3-(5- AND 6-)BENZOYLPHENYLACETIC ACIDS, ESTERS AND METAL SALTS THEREOF AND THE COMPOUNDS

William J. Welstead, Jr., and Henry W. Moran, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

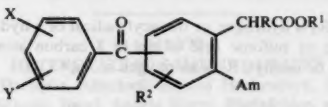
Continuation-in-part of Ser. No. 487,499, July 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,625, April 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 254,285, May 17, 1972, abandoned. This application Aug. 13, 1975, Ser. No. 604,371

Int. Cl.[2] **A01N** *9/20;* **C07C** *101/447*

U.S. Cl. 424—309 **47 Claims**

1. The method for alleviating inflammation in a living animal

body with a minimum of undesirable side effects comprising internally administering to said living animal body an effective amount of a compound selected from the group having the formula:



wherein:

R is selected from the group consisting of hydrogen and lower alkyl,

R^1 is selected from the group consisting of hydrogen, lower alkyl, sodium and potassium

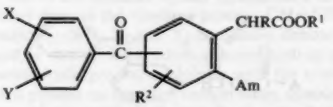
R^2 is selected from the group consisting of hydrogen, halogen having an atomic weight less than 80 and lower alkoxy,

X is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl,

Y is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl, and

Am is selected from the group consisting of primary amino and dimethylamino.

23. A compound selected from the group having the formula:



wherein;

R is selected from the group consisting of hydrogen and lower alkyl,

R^1 is selected from the group consisting of hydrogen, lower alkyl, sodium and potassium,

R^2 is selected from the group consisting of hydrogen, halogen having an atomic weight less than 80, and lower alkoxy,

X is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl,

Y is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl, and

Am is selected from the group consisting of primary amino ($-NH_2$) and dimethylamino.

4,045,577

VALUABLE MEDICINIAL PROSTAGLANDIN COMPOUNDS PREPARED FROM MATERIAL ISOLATED FROM THE SEA

Robert L. Spraggins, 1105 Mary Oaks, College Station, Tex. 77840, assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 154,193, June 17, 1971, abandoned. This application July 18, 1975, Ser. No. 597,212

Int. Cl.[2] A61K *31/215, 31/19;* **C07C** *177/00*

U.S. Cl. 424—311 **1 Claim**

1. A topical pharmaceutical preparation comprising 500 mg to 1500 mg of diasteroisomeric 15-propionyloxy-9-oxo-5-cis, 13-trans-prostadienoic acid mixed with 15 g of cetyl alcohol, 1 g of sodium lauryl sulfate, 40 g of liquid dimethylpolysiloxane, 43 g of sterile water, 0.25 g of methylparaben and 0.15 g of propylparaben.

4,045,578

N-CHLORO-AMINO ACID DERIVATIVES EXHIBITING ANTIBACTERIAL ACTIVITY

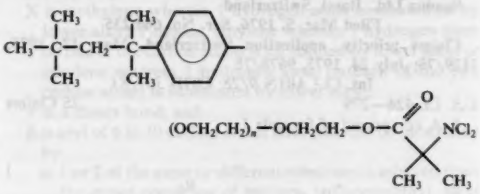
James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 479,560, June 14, 1974, Pat. No. 3,966,796. This application Mar. 8, 1976, Ser. No. 664,697

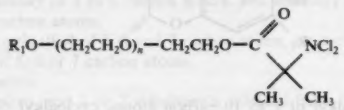
Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—311 **12 Claims**

1. A method for inhibiting bacterial growth which comprises applying thereto, an antibacterial effective amount of an ester of α-N,N-dichloroaminoisobutyric acid having the formula:



and



wherein R_1 represents a member selected from the group consisting of an *n*- or branched alkyl group of from 1 to 20 carbon atoms, a phenyl group and a naphthyl group; and wherein *n* represents an integer of from 1 to 11.

4,045,579

PROCESS FOR PASTEURIZING RAW POULTRY

Alan Barde Rogers, Palos Park, Ill., assignor to Armour and Company, Phoenix, Ariz.

Continuation of Ser. No. 477,058, June 6, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,629

Int. Cl.[2] A22C *21/04*

U.S. Cl. 426—327 **8 Claims**

1. A process for pasteurizing fresh or fresh frozen raw poultry comprising immersing said poultry having surface bacteria thereon in an edible oil, maintaining said oil at a temperature of from 180° F to 315° F and during the period after said poultry has been immersed in said oil at said temperature for ten seconds and before said poultry has been immersed in said oil at said temperature for sixty seconds, removing said poultry while still raw from said oil.

4,045,580

PHARMACEUTICAL PREPARATION USING 9-(2-HYDROXY-3-AMINO-PROPYL)-9,10-DIHYDRO-9,10-ETHANO-ANTHRACENES AS ANTIDEPRESSANTS

Max Wilhelm, Watchung, N.J.; Raymond Bernasconi, Oberwil, Switzerland; Angelo Storni, Rheinfelden, Switzerland; Dieter Beck, Basel, Switzerland, and Karl Schenker, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

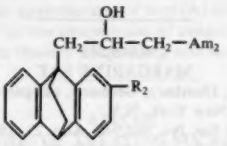
Division of Ser. No. 564,580, April 2, 1975, Pat. No. 4,017,542, which is a continuation-in-part of Ser. No. 226,329, Feb. 14, 1972, abandoned. This application Feb. 18, 1976, Ser. No. 659,069

Claims priority, application Switzerland, Feb. 23, 1971, 2578/71; Jan. 17, 1972, 669/72

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 5 Claims

1. An antidepressant pharmaceutical preparation comprising an antidepressively effective amount of a member selected from the group consisting of a compound of the formula



wherein R_2 represents a member selected from the group consisting of trifluoromethyl, chloro and hydrogen, and Am_2 denotes a member selected from the group consisting of diethylamino, monoethylamino, dimethylamino and monomethylamino, and a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutical carrier.

4,045,581

LONG-LASTING MINT-FLAVORED CHEWING GUM

Donald A. M. Mackay, Pleasantville; Frank Witzel, Spring Valley, both of N.Y.; Basant K. Dwivedi, Hopatcong, and Daniel Schoenholz, Basking Ridge, both of N.J., assignors to Life Savers, Inc., New York, N.Y.

Continuation of Ser. No. 577,589, May 15, 1975, abandoned. This application June 14, 1976, Ser. No. 695,487

Int. Cl.[2] A23G *3/30*

U.S. Cl. 426—3 5 Claims

1. A flavored chewing gum having a prolonged sweet taste comprising gum base, the free acid form of saccharin dispersed in said gum base, and flavoring, said free acid form of saccharin being present in an amount of from about 0.05 to about 0.5% by weight of the chewing gum and further including from about 0.05 to about 90% by weight of one or more water-soluble sweetening agents at least one of which is sucrose.

4,045,582

BENEFICIATION OF URIC ACID FROM NATURAL PRODUCTS

John D. Douros, Jr., Littleton, and Ira T. Warder, Jr., Lakewood, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 389,392, Aug. 15, 1973, which is a division of Ser. No. 80,517, Oct. 7, 1970, Pat. No. 3,850,930. This application May 26, 1976, Ser. No. 690,137

Int. Cl.[2] A23K *1/22*

U.S. Cl. 426—69 2 Claims

1. The process of producing a uric acid containing feed supplement for ruminant animals comprising the steps of:

collecting uric acid containing waste material within 120 hours of excrement;

promptly drying said collected material at a temperature of from 140° F. to 390° F. to remove a substantial portion of the water and to assure complete kill of microorganisms to prevent further decay and to render the material non-toxic; and

grinding the dried material and collecting that fraction of ground material of 80 mesh or smaller size.

4,045,583

METHOD OF MANUFACTURING A CHOCOLATE PRODUCT

Maurice Stanley Jeffery, Solihull; Paul Anthony Glynn, Birmingham, and Mohammed Moiz Uddin Khan, Solihull, all of England, assignors to Cadbury Limited, Birmingham, England

Filed July 14, 1976, Ser. No. 705,207

Claims priority, application United Kingdom, July 22, 1975, 30570/75

Int. Cl.[2] A23G *1/00*

U.S. Cl. 426—241 11 Claims

1. A method of manufacturing a shaped heat-resistant chocolate product comprising the steps of (i) thoroughly mixing at least the following ingredients: water, 15 to 35% by weight of at least one edible fat selected from (a) cocoa butter and (b) cocoa butter and at least one other fat, and not less than 40% by weight of sugar, said percentages being based on the total weight of the chocolate product, so as to produce an aqueous sugar solution in which said at least one edible fat is emulsified with the solution, (ii) maintaining said at least one edible fat emulsified with the aqueous sugar solution, evaporating sufficient water from the solution to prevent separation of said at least one edible fat from the said aqueous sugar solution, (iii) shaping the resultant evaporated mixture, and (iv) drying the shaped mixture so as to produce a shaped heat-resistant chocolate product having a moisture content of not more than 5% by weight and such that individual particles of said at least one edible fat are encapsulated in a sugar glass.

11. A method as claimed in claim 1, wherein the drying step is effected by heating by micro-wave energy.

4,045,584

FOOD PRODUCT COATING APPARATUS AND METHOD

Richard E. Jones, and Donald F. Jago, both of Duluth, Minn., assignors to Jeno's, Inc., Duluth, Minn.

Division of Ser. No. 618,905, Oct. 2, 1975. This application Nov. 17, 1976, Ser. No. 742,624

Int. Cl.[2] B05B *3/02*

U.S. Cl. 426—289 2 Claims

1. A method of coating a surface of an article of food with granular food product at a selected density comprising the steps of

transporting an article of food to be coated along a preselected path at a predetermined speed;

enclosing a quantity of granular material to be coated on said article of food above said preselected path;

agitating said granular material with height adjustable rotatable agitating auger;

metering said agitated granular material with a pair of height adjustable rotatable distributing augers to a distributing surface forming a pair of elongated parallel slots positioned normal to the preselected path and having an adjustable orifice plate to define an opening between the elongated slot and orifice plate above said predetermined path and through which a metered quantity of granular food material enabling an article of food to be coated to pass thereunder;

adjusting the height of the agitating auger and distributing auger relative to the elongated slots at a selected height to enable a controlled weight of granular material to be metered from the agitating auger to the elongated slots in a circular pattern by said distributing auger;

adjusting the orifice plate to set the opening defined by the elongated slots and orifice plate at selected cross-sectional areas for passing the metered quantity of granular material

therethrough at a selected density and onto an article of food located thereunder; and

rotating said distributing augers and said agitating auger at a variable selected speed required to meter a selected quantity of granular material through said openings and onto said article of food being transported therepast at said predetermined speed.

4,045,585

FLAVORED ANIMAL FOOD COMPOSITIONS

Milo D. Appleman, Los Angeles, and Stanislao A. DeSantis, Rolling Hills, both of Calif., assignors to Decel Corporation, Los Angeles, Calif.

Filed May 19, 1976, Ser. No. 688,085
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—331 **19 Claims**

1. A coherent and physically stable, flavored animal food composition adapted to be used in the preparation of canned or expanded pet foods which consists essentially of:

flour from about 50 to about 75 wt. %, moisture from about 18 to about 30 wt. %, fat from about 2 to about 10 wt. %, and

comminuted natural flavor material selected from the group consisting of cheese, poultry, liver, kidney, fish and mixtures thereof, said natural flavor material being fresh, dried or mixtures thereof in an amount at least sufficient to impart flavor to the composition with the upper limit thereof being about 25 wt. % providing, however, that the upper limit for dried natural flavor material is about 12.5 wt. %.

4,045,586

SOLUBLE COFFEE OF IMPROVED STABILITY AND FLAVOR

Robert Franklin Howland, New City; Michael Herman Mansky, Tarrytown, and Willie James Richards, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 7, 1975, Ser. No. 575,551
The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.
Int. Cl.[2] A23F *1/04*
U.S. Cl. 426—387 **8 Claims**

1. A process for preparing soluble coffee powder of improved stability on storage comprising:

a. removing a portion of the aromatics from an aqueous coffee extract by subjecting said extract to evaporation for a time sufficient to remove from about 2 to about 20% by weight of said extract;

b. drying the remaining extract from (a);

c. condensing and collecting said removed aromatic portion;

d. mixing said collected aromatic portion in solution with a water-soluble carbohydrate fixative selected from the group consisting of dextrins, corn syrup solids, dextrose, lactose and gums and drying the resulting solution; and

e. mixing the dried product of (b) with at least a portion of the dried product of (d).

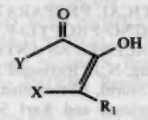
4,045,587

FOODSTUFF FLAVORING METHODS AND COMPOSITIONS

Ira Katz, Elberon; Alan O. Pittet, Atlantic Highlands; Richard Arnold Wilson, Monmouth Beach, and William John Evers, Long Branch, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 13, 1970, Ser. No. 2,667
Int. Cl.[2] A23L *1/22*
U.S. Cl. 426—533 **24 Claims**

1. A process comprising heating in solution at least one cyclic carbonyl compound having the formula



wherein the dashed line is a single bond or a carbon-carbon double bond; Y is —O—, $-CR_3R_4-$ or $=CR_3-$; X is —O— or $-CR_2R_5-$ when the dashed line is a single bond and Y is $-CR_3R_4-$; X is $-CR_2R_5-$ when the dashed line is a single bond and Y is —O—; X is $=CR_2-O-$ when the dashed line is a double bond, and Y is $=CR_3-$ when the dashed line is a double bond; R_1, R_2, R_3, R_4, and R_5 are the same or different and are lower alkyl or hydrogen; with hydrogen sulfide in the molar ratio of sulfide to carbonyl compound of from about 0.05:1 to about 3:1 under a pressure of from about two to ten atmospheres to produce a hearty flavoring material, said solution being substantially free of esters of hydroxy polybasic acids.

4,045,588

MARGARINE FAT

Theophil Wieske, Hamburg, Germany, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 501,946, Aug. 29, 1974, abandoned.
This application Jan. 21, 1976, Ser. No. 650,999
Int. Cl.[2] A23D *3/00*
U.S. Cl. 426—607 **5 Claims**

1. Margarine fat consisting essentially of (a) a liquid vegetable oil having a polyunsaturated fatty acid content of at least 40% and (b) 5–30% of a hard fat containing:

I. 25–60% of triglycerides containing three saturated fatty acids with 16–24 carbon atoms and triglycerides containing two saturated fatty acids with 16–24 carbon atoms and one mono-trans-unsaturated fatty acid with 16–24 carbon atoms,

II. 35–70% of saturated fatty acids with 16–24 carbon atoms,

III. 20–35% of mono-trans-unsaturated fatty acids with 16–24 carbon atoms,

IV. 0.25% of saturated fatty acids with 12–14 carbon atoms,

V. 15–45% of saturated fatty acids with 2–14 carbon atoms and mono-trans-unsaturated fatty acids with 16–24 carbon atoms,

VI. the balance being the remaining fatty acids, to provide from 0.2–5% triglycerides containing three saturated fatty acids with 16–20 carbon atoms in the margarine fat.

4,045,589

FAT EMULSION PRODUCT AND PROCESS FOR PRODUCING THE SAME

Gary E. Petrowski, Santa Monica; John M. Wolcott, Burbank, and Erlinda P. Ortiz, Ontario, all of Calif., assignors to Carnation Company, Los Angeles, Calif.

Filed June 21, 1976, Ser. No. 697,837
Int. Cl.[2] A23C *11/00*
U.S. Cl. 426—609 **18 Claims**

1. A dry, protein-free coffee whitener which comprises a dried emulsion concentrate containing

from 0%-55% by weight of a water soluble carbohydrate,

from 0.2%–1.25% of an emulsifier, and

from 20%–50% by weight of an edible fat having an average particle size of about 1–3 microns in diameter, said fat being stabilized with a chemically modified dextrinized starch derivative having a lipophilic character in an amount sufficient to provide the product with a starch derivative to fat ratio of between about 0.4–1.25 to 1, and

a buffering salt in an amount sufficient to provide the product with a pH in the range of 6–7 when reconstituted.

4,045,590

MEAT ANALOG FROM AGGLOMERATED PROTEIN

Dwight Carl Weigle, Anderson Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 4, 1976, Ser. No. 729,522
Int. Cl.[2] A23J *3/00*; A23L *1/20*
U.S. Cl. 426—656 4 Claims

1. A process for making a simulated comminuted meat product comprising the steps of:

A. contacting, under conditions of mild agitation and in the presence of from about 5% to about 35% fat, a mixture of from about 5% to about 20% of a first heat-coagulable protein and from about 5% to about 20% of a second heat-coagulable protein with from about 25% to about70% water having a temperature at least equal to the temperature of coagulation of said first protein but less than the temperature of coagulation of said second protein, said agitation being sufficient to form agglomerates; and

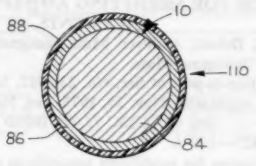
B. heating the agglomerates of step (A) to a temperature at least equal to the temperature of coagulation of said second protein thereby coagulating said second protein.

4,045,591

METHOD OF TREATING SUCKER ROD

Bobby L. Payne, Midland, Tex., assignor to Rodco, Inc., Odessa, Tex.

Continuation-in-part of Ser. No. 490,210, July 19, 1974, Pat. No. 3,958,049, which is a continuation-in-part of Ser. No. 195,658, Nov. 4, 1971, abandoned. This application May 3, 1976, Ser. No. 682,380
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.[2] E21B *17/00*; C23C *7/00*
U.S. Cl. 427—37 10 Claims



1. A continuous process for improving ferrous metal sucker rods wherein the rods are protected against corrosion and hydrogen ion embrittlement comprising the steps of:

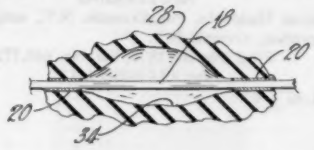
1. cleaning the surface of the rods to remove debris and scale therefrom;
2. mechanically cold working and further cleaning the exterior surface of the cleaned rods of step (1) by shot peening the surface thereof;
3. electronically inspecting the rods to determine the symmetry of composition;
4. electronically inspecting the rods to determine the presence of flaws therein;
5. discarding those rods of steps (3) and (4) whose structural integrity is deficient for carrying its designed load;
6. coating the exterior surface of the remaining rods of step (5) with a stainless steel metal alloy by using an electric arc metal spray apparatus;
7. carrying out the coating step (6) immediately following the inspection steps (3) and (4); and, carrying out the inspection steps (3) and (4) immediately following the cleaning step (2) so that the coating is applied before appreciable oxidation can occur.

4,045,592

METHOD OF MAKING STRETCHABLE AND COMPRESSIBLE ELONGATE MEMBER

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 608,592, Aug. 28, 1972, which is a continuation of Ser. No. 483,860, June 27, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 637,992
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—45 10 Claims



1. A method of making a stretchable cord comprising:

supplying a bundle of generally parallel continuous glass filaments;

applying a coating of vaporizable material to filaments;

subsequently applying a thermosetting elastomeric material to the bundle such that the material impregnates and surrounds the bundle and separates the filaments;

forming a vapor impervious skin on the outer surface thereof; and

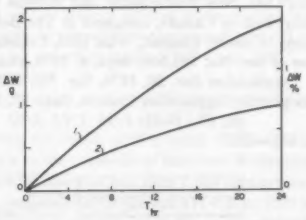
applying energy to heat such bundle sufficient to effect curing the elastomeric material and such that at least a portion of the vaporizable material will vaporize to form irregular voids randomly located in the elastomeric material whereby the filaments assume undulating paths in the vicinity of the voids and whereby bulbous enlargements are formed at the outer suface of the cord in the vicinity of the voids.

4,045,593

METHOD FOR PRODUCING MOISTURE RESISTANT ELECTRODES

David C. Hill, Somers, and Edith M. Flanigen, White Plains, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 379,917, July 17, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 598,216
Int. Cl.[2] B05D *5/12, 3/04*
U.S. Cl. 427—59 7 Claims



1. A method for treating the outer surfaces of covered electrodes to make them moisture resistant, comprising; forming an aqueous dispersion consisting of water and a silicon containing material selected from the class consisting of soluble amorphous solid silicas and soluble silicates of lithium and potassium in a concentration of from about 1 to 20% by weight silica; applying said aqueous dispersion to each covered electrode outer surface for a period of from about 1 minute to about 5 hours at a temperature of from about 5° to 95° C, and drying each electrode outer surface until essentially all of the water is

driven off whereby a uniform and thin film deposit is formed upon each electrode outer surface having a composition containing substantially oxides of silicon, said film deposit being formed by mass transport of the silicon containing material through the aqueous dispersion.

4,045,594

PLANAR INSULATION OF CONDUCTIVE PATTERNS BY CHEMICAL VAPOR DEPOSITION AND SPUTTERING

Fred Sterns Maddocks, Poughkeepsie, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,772
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—89 **28 Claims**

1. A method for forming a conductive pattern atop a substrate comprising:

forming a first insulating film on said substrate;

forming a masking layer of photosensitive material on said first insulating film, said masking layer having at least one aperture;

forming apertures in said first insulating film corresponding to said masking-layer apertures;

depositing a conductive film atop said masking layer and into said apertures, the surface of said conductive film in said apertures being substantially flush with the surface of said first insulating film;

said deposition resulting in gaps between said conductive film in said apertures and insulating film;

removing said masking layer, thereby leaving a conductive pattern in said apertures;

forming on said first insulating film and said conductive pattern a second insulating film by a chemical vapor deposition reaction;

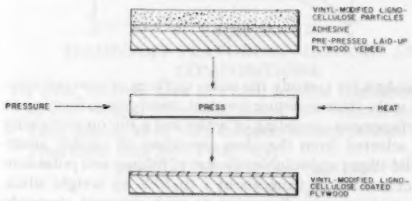
said second insulating film having a thickness which is at least one-half that of the width of the largest of said gaps, whereby a substantially planar second insulating film is formed.

4,045,595

COATING WOOD SURFACE BY VINYL-MODIFIED LIGNOCELLULOSIC PARTICLES

Shui-Tung Chiu, New Westminster, and William Melvin Turko, Burnaby, both of Canada, assignors to The Borden Chemical Company (Canada) Limited, West Hill, Canada

Division of Ser. No. 503,640, Sept. 6, 1974, abandoned. This application Jan. 20, 1976, Ser. No. 650,808
Claims priority, application Canada, June 13, 1974, 202417
Int. Cl.[2] B05D *1/36, 3/12, 3/02*
U.S. Cl. 427—202 **9 Claims**



1. A method for producing a coating on a lignocellulose based panel board, which comprises the steps of applying on the panel board surface a conventional resin adhesive; spreading thereon vinyl-modified lignocellulosic particles made by a free-radical donor initiated polymerization of ethylenically unsaturated monomers on substrate lignocellulosic particles to form a thermoplastic coating; and subjecting the coated panel board assembly to heat and pressure sufficient to soften and spread said thermoplastic coating and thereby form a thin, hard, integral surface coating in situ on said panel board.

4,045,596

SUPERFICIAL TREATMENT OF STEEL

Pierre Guiraldenq; Daniel Tréheux, and Daniel Marchive, all of Ecully, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 3, 1976, Ser. No. 692,415
Claims priority, application France, June 12, 1975, 75.19016
Int. Cl.[2] C23C *9/00*
U.S. Cl. 427—229 **5 Claims**

1. A method for the treatment of steel surfaces to form thereon an intermediate layer of ferrites and an outer layer on tin-iron compound of the type FeSn to improve their resistance to corrosion and their frictional properties which consists essentially:

in coating the parts with an organic varnish containing finely divided tin particles:

and in heating the coated parts to a temperature at least equal to 650° C but situated outside the range 700° C–970° C to eliminate the varnish, and maintaining said temperature for a time sufficient to cause the particles to react with the underlying steel and to form thereon said intermediate layer of ferrites and said outer layer of tin-iron compounds, the said outer layer being substantially continuous and firmly bound to the intermediate layer.

4,045,597

PROCESS FOR MODIFYING AMORPHOUS CARBON FILAMENTS

Harold E. Debolt, Andover, Mass., assignor to Avco Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 230,867, March 1, 1972. This application Nov. 24, 1975, Ser. No. 634,478
Int. Cl.[2] C23C *11/08*; B05D *3/02*
U.S. Cl. 427—248 A **7 Claims**

1. A process for modifying amorphous carbon filament for use as a filamentary reinforcement for composites comprising:

depositing a flash coating or boron on said filament;

subsequently heat treating the flash coated filament at a temperature above 2,100° C in an inert atmosphere for catalytically transforming the amorphous carbon into a skin layer of highly oriented graphite such that the resistance of the filament with the skin layer aas a whole decreases by a factor of at least two times.

4,045,598

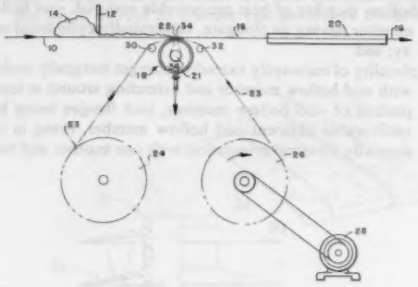
COATING METHOD AND APPARATUS

Jimmy B. Henson, Pacolet Mills, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 6, 1976, Ser. No. 683,721
Int. Cl.[2] B05D *3/00, 3/12*
U.S. Cl. 427—296 **1 Claim**

1. The method of providing a coated fabric on an apparatus having an elongated hollow manifold connected to a source of negative pressure and an elongated opening thereon comprising the steps of: providing a supply of fabric to be coated, applying a coating material to the fabric, passing the coated fabric over the elongated opening, passing a web material under the coated fabric into the hollow manifold over one side

of the elongated opening and out of the hollow manifold over the other side of the elongated opening to continuously clean



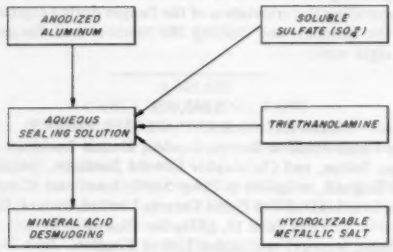
the elongated opening and curing the coated fabric after passage over said opening.

4,045,599

LOW TEMPERATURE SEALING OF ANODIZED ALUMINUM

Edward G. Remaley, New Kensington; Robert W. Baker, Natrona Heights, and Raymond J. Meyer, Apollo, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 15, 1976, Ser. No. 649,403
Int. Cl.[2] C25D *11/24*
U.S. Cl. 427—333 **8 Claims**



1. A method for forming a low temperature seal on anodized aluminum and removing sealing smudge therefrom comprising:

a. contacting said anodized aluminum with an aqueous sealing solution containing 2 to 6 g/l of hydrolyzable metallic salt, 5 to 20 ml/l of an ethanolamine, and 50 to 2000 mg/l soluble sulfate ($SO_4^=$), for a period of time sufficient to provide said seal, said solution being capable of providing a seal at a temperature of at least 140° F; and

b. removing sealing smudge formed in said prior step with mineral acid.

4,045,600

METHOD OF INHIBITING PLASTICIZER MIGRATION FROM PLASTICIZED POLY(VINYL CHLORIDE) SUBSTRATES

Gary E. Williams, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 18, 1976, Ser. No. 743,049
Int. Cl.[2] B32B *27/30*; D06N *3/04*; B44D *1/14*
U.S. Cl. 427—379 **5 Claims**

1. A method of inhibiting plasticizer migration from a plasticized polyvinyl chloride substrate comprising the steps of:

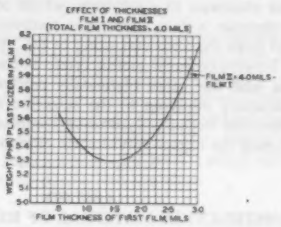
1. applying to the surface of said substrate a coating of a solution consisting essentially of an inert organic solvent and an isocyanate-terminated polyurethane, said coating having a viscosity of from 50 to 200 centipoise;

2. removing said inert organic solvent from the applied solution wherein a first substantially homogeneous film of thermosettable polyurethane is formed of from 1.0 to 2.0 mils in thickness;

3. applying to the substantially homogeneous film surface of Step 2 said coating solution of Step 1;

4. removing said inert organic solvent from the applied solution of Step 3 wherein a second substantially homogeneous film of a thermosettable polyurethane is formed of from 2.0 to 3.0 mils in thickness; and

5. repeating Steps 1 and 2 wherein said coating solution is applied to the surface of the second substantially homogeneous film of Step 4; thereby forming a third substantially homogeneous film, of from about 1.5 to 3.0 mils in thickness, whereby plasticizer migration from the polyvinyl chloride substrate to the third substantially homogeneous film is inhibited.


EFFECT OF THICKNESSES FILM I AND FILM II (TOTAL FILM THICKNESS = 4.0 MILS)
WEIGHT (PHR) PLASTICIZER IN FILM II
FILM II = 4.0 MILS - FILM I
FILM THICKNESS OF FIRST FILM, MILS

4,045,601

SOLVENT FINISHING OF FIBER GLASS FABRICS

George L. Brodmann, and Carl Nelson Schlatter, both of Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 567,469, April 14, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,223
Int. Cl.[2] B05D *1/38*
U.S. Cl. 427—381 **8 Claims**

1. A non-aqueous process for resin finishing and dyeing woven fiber glass fabric which comprises the steps of sequentially:

A. impregnating the fabric with a liquid pre-finishing composition having a surface tension of less than 30 dynes/cm. at 25° C.; which composition comprises (1) 0.1 to 5.0 weight percent of solvent soluble glass-reactive low molecular weight organosilicon compound and (2) organic solvent having a boiling point of 50° C. to 150° C. at 760 mm Hg pressure;

B. volatilizing a major portion of the organic solvent from the fabric;

C. impregnating the fabric with a liquid finishing composition having a surface tension of less than 30 dynes/cm. at 25° C.; and a viscosity of less than 1,000 centipoises at 25° C.; which composition comprises (1) 0.5 to 10.0 weight percent of solvent soluble synthetic resin selected from the group consisting of polyacrylics, polyurethanes, polyesters, and polysilicones; (2) pigment dye; and (3) single phase solvent comprising at least 90 percent by weight of aliphatic chlorinated hydrocarbon having 1 to 4 carbon atoms and no more than 5 chlorine atoms, said solvent having a boiling point between 50° C. to 150° C. at 760 mm Hg pressure; then

D. volatilizing a major portion of the aliphatic chlorinated solvent from the fabric thereby depositing resin and dye on the fabric.

4,045,602

ADHESION OF ORGANOPOLYSILOXANE ELASTOMERS TO SUBSTRATES

Oswin Sommer; Peter Huber, and Alois Strasser, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 17, 1976, Ser. No. 686,842

Claims priority, application Germany, May 26, 1975, 2523224

Int. Cl.[2] B05D *1/36, 7/06*

U.S. Cl. 427—386 **22 Claims**

1. A process for improving the adhesion of an organopolysiloxane elastomer to a substrate, which comprises (1) coating the substrate with a copolymer containing a compound selected from the class consisting of (a) 2-hydroxypropyl acrylate, 2-hydroxypropyl methacrylate and mixtures thereof, and (b) at least one other olefinically unsaturated monomer, (2) subsequently applying to the substrate a room temperature vulcanizable organopolysiloxane composition, and thereafter (3) curing the organopolysiloxane composition.

4,045,603

CONSTRUCTION MATERIAL OF RECYCLED WASTE THERMOPLASTIC SYNTHETIC RESIN AND CELLULOSE FIBERS

Teddy Van Smith, Dallas, Tex., assignor to Nora S. Smith, Dallas, Tex.

Filed Oct. 28, 1975, Ser. No. 625,896

Int. Cl.[2] B65D *71/00*

U.S. Cl. 428—2 **6 Claims**

1. A construction material comprising respective opposite face surfaces, said opposite face surfaces being contiguous with an intervening core material, said face surfaces consisting essentially of a re-hardened fused and rolled layer of thermoplastic synthetic resin material bits, said intervening core material consisting essentially of a compressed non-homogeneous mixture of cellulose aggregate material bits and re-hardened fused thermoplastic synthetic resin material bits, with said face surfaces being fused to respective opposite surfaces of said intervening core material.

4,045,604

RECOVERABLE ARTICLE WITH OUTWARDLY EXTENDING HOLLOW HEAT FLANGES; KIT INCLUDING SUCH ARTICLE AND A CYLINDRICAL SUBSTRATE; AND METHOD OF MAKING SUCH ARTICLE

Robin J. T. Clabburn, Highworth, England, assignor to Raychem Limited, London, England

Continuation-in-part of Ser. No. 513,111, Oct. 8, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,405

Claims priority, application United Kingdom, Oct. 8, 1974, 43536/74

Int. Cl.[2] B32B *1/08;* **H01B** *17/56;* **B29C** *27/24;* **F16H** *55/48*

U.S. Cl. 428—36 **9 Claims**

1. A heat recoverable article for covering a substrate, comprising

a hollow member of heat recoverable material, said hollow member having an elongate cavity of uniform cross section; and

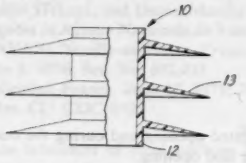
a plurality of outwardly extending flanges integrally molded with said hollow member and extending around at least a portion of said hollow member, said flanges being heat recoverable adjacent said hollow member, being in substantially identical orientation with one another and being capable of retaining substantially identical orientation with one another upon heat recovery of said hollow member and said flanges about a substrate.

7. A kit for a composite article, comprising

an elongate, substantially cylindrical substrate;

a hollow member of heat recoverable material, said hollow member having an elongate, substantially cylindrical cavity; and

a plurality of outwardly extending flanges integrally molded with said hollow member and extending around at least a portion of said hollow member, said flanges being heat recoverable adjacent said hollow member, being in substantially identical orientation with one another and being



capable of retaining substantially identical orientation with one another upon heat recovery of said hollow member and said flanges about said substrate.

9. A method for making a heat recoverable article having a hollow, substantially cylindrical member for covering a substrate and outwardly extending flanges symmetrical about the hollow, substantially cylindrical member including the steps of

molding said member with radially outwardly extending flanges;

expanding the member to a first heat recoverable state;

controlling the orientation of the flanges during expansion of the member; and cooling the member and flanges to a rigid state.

4,045,605

CARPETING HAVING STIFF FIBERS

Leon Frank Haddon Breens, London; Dennis Lockhart Armitage, Bolton, and Christopher Edward Summers, Swindon, all of England, assignors to Peter Smith Associates (Carpet Importers) Limited and Collie Carpets Limited, both of, England

Filed June 18, 1976, Ser. No. 697,526

Claims priority, application United Kingdom, June 24, 1975, 26701/75

Int. Cl.[2] B32B *33/00*

U.S. Cl. 428—88 **9 Claims**

1. A carpeting material comprising a backing fabric and fibres standing up from the backing fabric as pile or tufts, wherein the pile or tuft fibres comprise 75 to 98 percent by weight of conventional carpet yarns and 2 to 25 percent by weight of stiff fibres of filaments which are not plied with the conventional carpet fibre yarns and which are arranged to act as dirt scrapers, said carpet yarns being formed from fibres selected from the group consisting of nylon, acrylic, regenerated cellulose, wool, polyester, cotton and polypropylene fibres of less than 30 decitex per filament, and the stiff fibres or filaments being more resistant to being trodden down than the conventional carpet yarns.

4,045,606

PROTECTIVE COVER FOR AN ELECTRIC RANGE

Kurt Ulrich Kalkowski, Am Bleiberg 3, Mechernich-Kommern, Germany

Filed Nov. 21, 1975, Ser. No. 634,280

Claims priority, application Germany, Nov. 25, 1974, 2455693

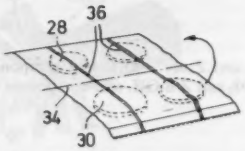
Int. Cl.[2] B32B *1/00, 3/00*

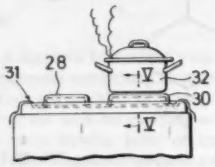
U.S. Cl. 428—174 **10 Claims**

1. A protective cover for an electric range having a stove plate and circular electric heating units comprising:

a piece of flexible heat resistant metal foil having good heat conductivity substantially covering said stove plate and said heating units;

bulges in said metal foil around said units and conforming to the shape thereof to prevent said protective cover from





slipping on said plate during use and to enclose said heating units to reduce heat losses therefrom; and,

at least one strip of a temperature indicating salt of a kind which changes color at a temperature of approximately 400° C so that said strip of salt extends over said heating units.

4,045,607

CABLE SHIELDING TAPE

Charles C. Swearingen, Bay Village, and Nicholas Sheptak, Rocky River, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 31,386, April 23, 1970, Pat. No. 3,770,570, which is a continuation-in-part of Ser. No. 734,392, June 4, 1968, abandoned. This application Aug. 1, 1973, Ser. No. 384,662

Int. Cl.[2] B32B *3/00, 7/14*

U.S. Cl. 428—200 **7 Claims**

1. A cable shielding tape comprising a metallic strip, a layer of an adhesive compolymer of an α-olefin and and α,β-ethylenically unsaturated carboxylic acid in mating relationship with at least one surface of said strip, and a fugitive release agent disposed between said metallic strip and said layer of the adhesive copolymer which defines at least one zone of reduced adhesion between said layer of the adhesive copolymer and said metallic strip, the fugitive release agent being of a type which will become absorbed by the adhesive copolymer such that the adhesion of said layer of the adhesive copolymer to said metallic strip can be increased by the application of heat.

4,045,608

FRICTION FACING WITH POROUS SHEET BASE

Robert A. Todd, 187 Mountain Ave., North Caldwell, N.J. 07006

Continuation-in-part of Ser. No. 508,090, Sept. 23, 1974, abandoned. This application June 9, 1976, Ser. No. 694,349

Int. Cl.[2] B32B *15/06, 15/08, 15/12*

U.S. Cl. 428—251 **13 Claims**

1. A friction facing comprising a porous sheet base material including cellulose fibers, an inorganic absorbent filler, and a retention agent in a proportion throughout said base of up to 13% by weight of said base for holding said porous sheet base material together; a first coating of a resin binder impregnant on said porous sheet base, and a second outer coating of an ethyl silicate binder impregnant on said resin coating, said base with said coatings being porous and absorbent.

4,045,609

GAS RESISTANT FOAM MATERIALS

John A. H. Hart, South March, Canada, assignor to Her Majesty the Queen in right of Canada, Canada

Continuation of Ser. No. 438,621, Feb. 1, 1974, abandoned, which is a division of Ser. No. 132,611, April 8, 1971, abandoned. This application Apr. 7, 1976, Ser. No. 674,492

Claims priority, application Canada, May 4, 1970, 081768

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—253 **11 Claims**

1. A laminated fabric material comprising an air and water permeable open cell solid flexible polyurethane foam resistant to passage therethrough of noxious chemicals in liquid or vapor form, said foam having dispersed therein particulate activated carbon of average particle size in the range of 7 to 10 microns and in an amount of at least 10% by weight of said foam but not in excess of 12 milligrams per sq. cm. of foam, said particulate activated carbon being bonded in said foam by an acrylic elastomeric binder which is substantially free from substances which substantially deactivate the carbon, said binder being present in an amount of from 15 to 100 parts by weight per 100 parts by weight of said activated carbon, and an air and water vapor permeable fabric backing to which said foam is bonded.

4,045,610

ANTIBIOTICS DESIGNATED XK-88 SERIES

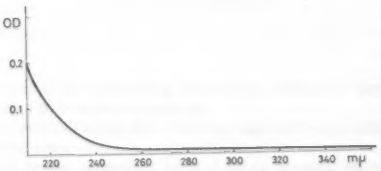
Takashi Nara, Tokyo; Seigo Takasawa, Hadano; Ryo Okachi, Machida; Isao Kawamoto, Machida; Mitsuyoshi Yamamoto, Machida; Seiji Sato, Machida; Tomoyasu Sato, Machida, and Atsuko Morikawa, Tama, all of Japan, assignors to Abbott Laboratories, N. Chicago, Ill.

Division of Ser. No. 516,816, Oct. 21, 1974, Pat. No. 3,939,043. This application Oct. 17, 1975, Ser. No. 623,308

Claims priority, application Japan, Oct. 24, 1973, 48-118932

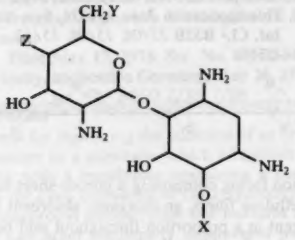
Int. Cl.[2] C07H *15/22*

U.S. Cl. 536—17 **9 Claims**

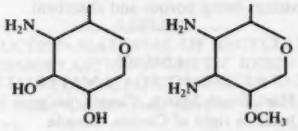


1. A composition of matter having antibacterial activity

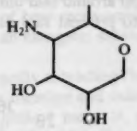
selected from the group consisting of XK-88-1, XK-88-2, XK-88-3 and XK-88-5 represented by the formula:



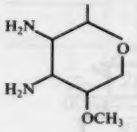
wherein X is



or —H; Y is $—NH_2$ or —OH; and Z is —H or —OH; and wherein when X is



Y and Z are —OH, said component being XK-88-1, or Y is NH_2 and Z is OH, said component being XK-88-3; and when X is

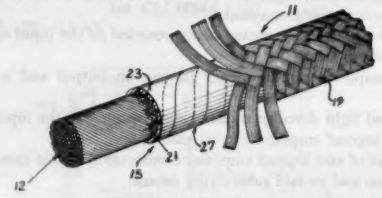


Y is NH_2 and Z is —H, said component being XK-88-5; and when X is —H, Y is NH_2 and Z is —H said component being XK-88-2; and the pharmaceutically acceptable acid addition salts thereof.

4,045,611
HERMETIC LEAD WIRE

Duane E. Torgerson, Oswego, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Sept. 30, 1975, Ser. No. 618,035
Int. Cl.[2] H01B 7/02
U.S. Cl. 174—121 SR 6 Claims



1. A hermetic lead wire for use in hermetically sealed electrical apparatus comprising an elongated central flexible conductor having a plurality of metallic strands extending longitudinally of the wire for carrying an electric current,

an inner flexible layer of meltable non-woven polyester fibers composed of fiber forming polymers of polyethylene terphthalate surrounding said central stranded conductor and disposed in direct engagement with said central stranded conductor for interlocking with the conductor when melted with a heated stripping tool during the manufacture of said apparatus,

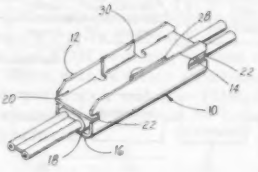
an outer flexible layer of plastic film surrounding said inner layer of meltable non-woven polyester fibers and providing a dielectric shield for the wire, said non-woven polyester fibers being secured to and carried by said plastic film layer and being applied to said metallic strands by said plastic film layer, and

an outer braided flexible sheath of polyester surrounding said plastic film and providing a protective shield for said plastic film layer.

4,045,612
SPLICE CASE HOUSING

Michael Troy, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sept. 22, 1975, Ser. No. 615,818
Int. Cl.[2] H02G 15/10
U.S. Cl. 174—136 3 Claims



1. A housing for a splice case comprising

a rigid channel member including parallel sidewalls, said sidewalls including notches therethrough at either end of each said sidewall;

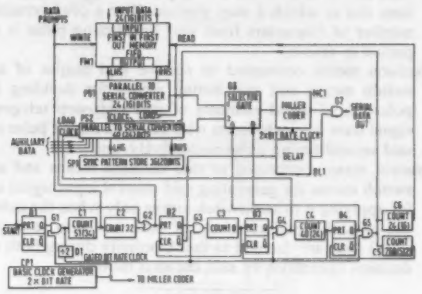
a plate extending across said channel member between said parallel sidewalls and including tabs on either side thereof engaging said notches in said parallel sidewalls, said tabs and said notches allowing limited movement perpendicular to the plane of said plate; and

flanges extending from said plate parallel to said parallel sidewalls, said flanges extending outwardly from said channel beyond said parallel sidewalls.

4,045,613
DIGITAL STORAGE SYSTEMS

Ian Clive Walker, Newbury, England, assignor to Micro Consultants, Limited, England

Filed Mar. 26, 1976, Ser. No. 670,935
Claims priority, application United Kingdom, Mar. 26, 1975, 12607/75
Int. Cl.[2] H04L 7/00
U.S. Cl. 178—69.1 10 Claims



8. A method of inserting synchronising data between blocks of serial data comprising:

a. producing a predetermined synchronising data sequence,

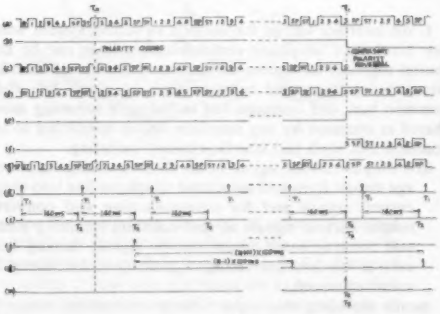
b. selecting either said serial data or said synchronising data, and

c. controlling said selected data to produce an identification gap in the data of a length equivalent to N bits of data before the start of the synchronising data which synchronising data is followed by said serial data.

4,045,614
SYSTEM FOR CONTROLLING POLARITY STATE OF START-STOP TELEGRAPH SIGNAL TRAIN

Fumio Takahata; Toshio Takahashi, and Yasuo Hirata, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Mar. 2, 1976, Ser. No. 663,142
Claims priority, application Japan, July 18, 1975, 50-88005
Int. Cl.[2] H03K 1/17; H04B 1/16
U.S. Cl. 178—69.1 8 Claims



1. A system for controlling the polarity states of a start-stop telegraph signal train comprising:

input terminal means for receiving said start-stop telegraph signal train;

switch means connected to said input terminal means for reversing the polarity state of said start-stop telegraph signal train in response to a control input signal applied thereto;

output terminal means connected to receive the output of said switch means for sending out said controlled start-stop telegraph signal train having the correct polarity state;

timing means connected to receive the output of said switch means for generating first timing pulses and second timing pulses, each of said first timing pulses being included in a time slot at which the stop element of a character of said start-stop telegraph signal train is expected to arrive, at least one of said second timing pulses being included in a time slot at which a stop element after a predetermined number of characters from said first timing pulse is expected to arrive;

decision means connected to receive said output of said switch means and said timing means for deciding the polarities of signal elements of said start-stop telegraph signal train in synchronism with said first timing pulse and said second timing pulse respectively; and

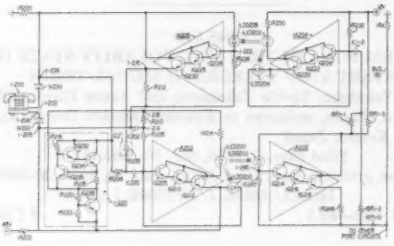
control means connected to said decision means and said switch means for generating said control input signal and for applying it to said switch means only when the polarities of said signal elements of said start-stop telegraph signal train are decided as the A-polarity during both the decision operations by said decision means.

4,045,615

MONOBUS INTERFACE CIRCUIT USING OPTO-COUPLED HYBRIDS

Dennis Bryan James, Rumson; Chao Kai Liu, Matawan, and Douglas Charles Smith, Rumson, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 21, 1976, Ser. No. 688,787
Int. Cl.[2] H04M *3/56*
U.S. Cl. 179—1 CN **4 Claims**



1. An interface circuit for use in a switching system where any number of telephone communication lines can be connected together for transmission purposes, one said interface circuit being interposed between each telephone line and a common bus, said common bus including a summing means shared in common by any interface circuit connected to said common bus, each said interface circuit including,

first output current signal means for converting input voltage signals from said associated telephone line into output current signals and for communicating said converted output current signals to said common summing means, said communicated output current signals thereby being convertible into bus voltage signals by said common bus summing means,

means including said input voltage converting means for applying any converted bus voltage signals to said telephone line associated therewith,

means including said input voltage converting means for subtracting from said applied converted bus voltage signals any portion of said converted voltage signals which are representative of input voltage signals received over said associated telephone line,

said input voltage converting means including:

a first amplifier circuit means having an output and an input;

a first light-emitting means coupled to the output of the first amplifier circuit means;

first and second light detector means, the first and second light detector means being positioned so as to receive light from the first light-emitting means;

the first and second light detector means being characterized in that incident light thereon is proportional to the current induced therethrough; and the ratio of the induced currents is essentially constant,

the first light detector means being coupled to the input of the first amplifier;

second amplifier circuit means having an output and an input;

the second light detector means being coupled to the input of the second amplifier circuit means;

the output of said second amplifier connectable to said common bus and to said subtracting means;

said telephone line applying means including:

third amplifier circuit means having an input and an output;

a second light-emitting means coupled to the output of the third amplifier circuit means;

third and fourth light detector means, the third and fourth light detector means being positioned so as to receive light from the second light-emitting means;

the third and fourth light detector means being characterized in that incident light thereon is proportional to the current induced therethrough and the ratio of the induced currents is essentially constant;

the third light detector means being coupled to the input of the third amplifier circuit means,

fourth amplifier circuit means having an output and an input; and wherein

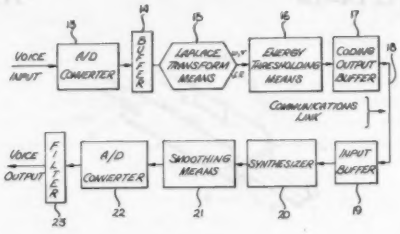
said fourth light detecting means is coupled to the input of said fourth amplifier circuit means, and the output of said fourth amplifier circuit means connectable to said telephone line.

4,045,616

VOCODER SYSTEM

Edwin A. Sloane, Los Altos, Calif., assignor to Time Data Corporation, Santa Clara, Calif.

Filed May 23, 1975, Ser. No. 580,479
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SA **32 Claims**



1. A vocoder system comprising:

input means for receiving an input signal;

time-domain to frequency-domain transformation means for determining s-plane pole locations and residues for said input signal coupled to said input means and for providing an output signal representative of such pole locations and residues; and

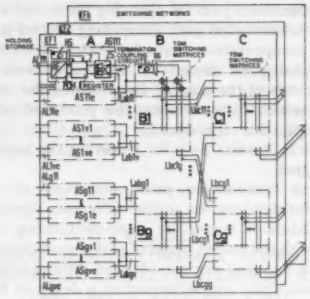
synthesizing means for synthesizing a signal from said output signal representative of such pole locations and residues, coupled to said transformation means;

whereby a signal representative of voice or the like may be stored or transmitted in the form of s-plane parameters.

4,045,617
TELECOMMUNICATION SWITCHING NETWORK HAVING A MULTISTAGE REVERSED TRUNKING ARRANGEMENT

Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 10, 1975, Ser. No. 630,639
Claims priority, application Germany, Nov. 14, 1974, 2454090
Int. Cl.² H04J 3/00
U.S. Cl. 179—15 AT **3 Claims**



1. A telecommunication switching network having a multistage, reversed trunking arrangement and switching on a four wire basis, said switching network being constructed to operate as a pulse code modulation (PCM) time division multiplex (TDM) network, comprising:

a number *e . v . g .* of single channel subscriber lines connected to a first switching stage of said network wherein said subscriber lines are divided into a number *g* groups, each group containing a number *v* subgroups and each subgroup containing a number *e* terminals,

a number *e* of termination coupling circuit means in each said subgroup in said first switching stage for supplying information on said subscriber lines in PCM/TDM form, each said termination coupling circuit means having an input individually conncted to a said subscriber line,

a number of *g.v* of TDM trunks, said trunks being individually connected to outputs of the said termination coupling circuit means in differing ones of said subgroups, each said trunk being constructed to carry a number *z* of time slots thereby forming a number *z.v.g* connection channels from said first to a second switching stage,

a first number g of TDM switching matrices in a second stage, each switching matrix having *v* inputs and *g* outputs, each said switching matrix having inputs connected to those of said TDM trunks connected to the said termination circuit means in a given group and

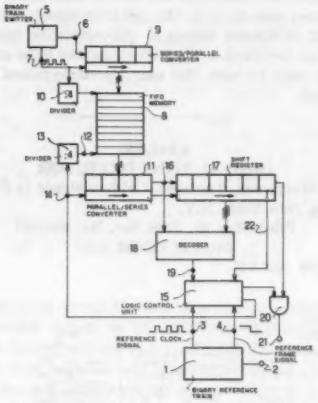
a second number *g* of TDM switching matrices in a third stage having *g* inputs, each of which is individually connected to an output from a said first TDM switching matrix, said third stage having outputs for connection to other switching networks.

4,045,618
DEVICE FOR SYNCHRONIZING A BINARY DATA TRAIN IN RELATION TO A REFERENCE TRAIN

Jean-Louis Lagarde, Arpajon, and Gilles Gauriat, Paris, both of France, assignors to Compagnie Industrielle des Telecommunications CIT-ALCATEL S.A.

Filed Jan. 29, 1976, Ser. No. 653,637
Int. Cl.² H04L 7/00; H04J 3/06
U.S. Cl. 179—15 BS **2 Claims**

1. A device for synchronizing a binary data series train in relation to a reference train, the two trains having identical frequencies and being subdivided by predetermined locking bits into frames of identical lengths, the device comprising: a series/parallel-type first converter receiving the binary train in series and delivering this train, cut up randomly in words of *q* bits (*q* = 2, 3, . . .); a FIFO-type memory having *q* bits per memory cell therein and receiving words at a regular writing speed of 1/q of the frequency; a parallel/series-type second converter receiving the output of said memory; a decoder for detecting the predetermined locking bits from an output train

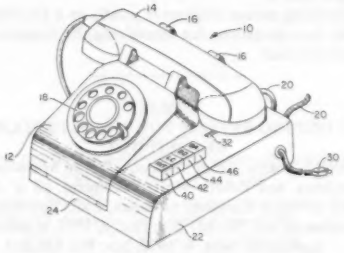


of said second converter; logic control means for receiving a pulse clock signal and frame synchronization signal of the reference train as well as the output of said decoder, for controlling the reading operation of said memory; and gate means for delivering the binary train to a synchronized output of the device.

4,045,619
TELEPHONE CONTROL SYSTEM

Laurence P. Harrington, Arlington, Mass., assignor to Aristonics Corporation, Woburn, Mass.

Continuation-in-part of Ser. No. 558,962, March 17, 1975, abandoned. This application Oct. 14, 1975, Ser. No. 622,006
Int. Cl.² H04M 1/66
U.S. Cl. 179—18 DA **29 Claims**



1. Apparatus for controlling the level of calling permitted through a telephone facility according to the authorization level of the particular user of the facility, the facility being of the type including at least one telephone set to be controlled and at least one telephone line capable of transmitting calls of varying levels to and from the telephone set, the telephone set being adapted for use by at least one user, said user being assigned a call authorization code that identifies the user and that represents the level of calling permitted for the user over the telephone line, said apparatus comprising:

A. means associated with each telephone set to be controlled for generating signals representing the call authorization code of the user;

B. means associated with each telephone set to be controlled

for generating signals representing the level of a call to be extended through the telephone set by the user;

C. means for switchably connecting the telephone set to the telephone line; and

D. control means including

i. means responsive to the user authorization code signals for establishing a predetermined maximum level of authorized telephone use for the user, and

ii. means responsive to the call level signals for activating said switchable means to disconnect the telephone set from the telephone line when the call to be extended by the user exceeds the user's predetermined maximum level.

4,045,620

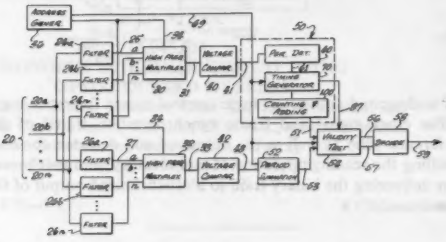
DIGITAL TONE DETECTOR

James E. Westbrook, Torrance, Calif., assignor to Conrac Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,622

Int. Cl.[2] H04M *1/50*

U.S. Cl. 179—84 VF **17 Claims**



1. Apparatus for discriminating multi-tone telephone signals, comprising

period means for detecting individual cycles of a received tone,

timing means responsive to the period means for producing for every *n* tone cycles a binary code representation of the time elapsed during N consecutive tone cycles, where N is larger than *n*,

and decoding means responsive jointly to a plurality of said code representations for identifying the frequency of the received tone.

4,045,621

RECORDING SYSTEM FOR A MULTICHANNEL RECORD DISC

Isao Ohwaki, Tokyo; Kohei Sasamura; Teruo Muraoka, both of Sagamihara, and Takaro Mori, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 421,268, Dec. 3, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,263

Claims priority, application Japan, Dec. 7, 1972, 47-122046; Dec. 14, 1972, 47-124799

Int. Cl.[2] G11B *3/00, 3/74*

U.S. Cl. 179—100.4 ST **1 Claim**

1. A multichannel record disc recording system comprising:

matrix means for forming a first sum signal and a first difference signal responsive to first and second channel signals, and for forming a second sum signal and a second difference signal responsive to third and fourth channel signals;

a first transmission path for receiving the first sum signal,

said first transmission path comprising first tracing distortion compensation means for imparting a complement of the distortion caused by the first sum signal, to thereby cancel the tracing distortion of the first sum signal, which distortion may be produced when a recorded signal is reproduced;

a second transmission path for receiving the first difference signal,

said second transmission path comprising first delay means for delaying the first difference signal, and first modulator means for angle-modulating a carrier signal responsive to the output signal of said first delay means to produce a first angle-modulated difference signal;

said first delay means imparting a delay to the first difference signal which complements the delay imparted by said first tracing distortion compensation means to the first sum signal passing therethrough;

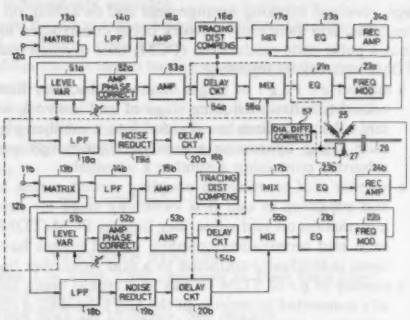
a third transmission path for receiving the second sum signal,

said third transmission path comprising second tracing distortion compensation means for imparting a complement of the distortion caused by the second sum signal to thereby cancel the tracing distortion of the second sum signal, which distortion may be produced when a recorded signal is reproduced;

a fourth transmission path for receiving the second difference signal,

said fourth transmission path comprising second delay means for delaying the second difference signal, and second modulator means for angle-modulating the carrier signal with the output signal of said second delay means to produce a second angle-modulated difference signal,

said second delay means imparting a delay to the second difference signal which complements the delay imparted



by said second tracing distortion compensation means to the second sum signal passing therethrough;

mixing means for multiplexing the output signal of said first transmission path and the first angle-modulated difference signal, thereby producing a first multiplex signal, and for multiplexing the output signal of said third transmission path and the second angle-modulated difference signal, thereby producing a second multiplex signal;

means comprising a cutting stylus for recording the first and second multiplex signals respectively on the left and right walls of a single groove on a disc;

a fifth transmission path for receiving a part of the first sum signal,

said fifth transmission path comprising first correction means for correcting the received part of the first sum signal to cancel any phase modulation distortion which may be produced in the first angle-modulated difference signal responsive to the output signal of said first transmission path at the time when the recorded first multiplex signal is reproduced by means of a reproducing stylus;

a sixth transmission path for receiving a part of the second sum signal,

said sixth transmission path comprising second correction means for correcting the received part of the second sum signal to cancel any phase modulation distortion which may be produced in the second angle-modulated difference signal responsive to the output signal of said third transmission path at the time when the recorded second

multiplex signal is reproduced by means of the reproducing stylus;

second mixing means in said second transmission path and disposed between said first delay means and said first modulator means,

said second mixing means mixing the output signal of said first delay means and the output signal of said first correction means, said first modulator means modulating the carrier signal responsive to the output of said second mixing means; and

third mixing means in said fourth transmission path and disposed between said second delay means and said second modulator means,

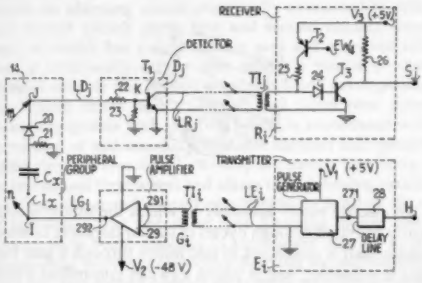
said third mixing means mixing the output signal of said second delay means and the output signal of said second correction means, said second modulator means modulating the carrier signal responsive to the output signal of said third mixing means.

4,045,622

METHOD OF MONITORING A NETWORK OF PERIPHERAL ELEMENTS HANDLED BY AN ELECTRONIC CONTROL UNIT

Gerard Le Cardonnel; Pierre Gravez, and René Marc Favre, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 2, 1976, Ser. No. 672,886
Claims priority, application France, Apr. 4, 1975, 75.10625
Int. Cl.[2] H04M *3/26*
U.S. Cl. 179—175.2 C **7 Claims**



1. A method of monitoring a network of *n* groups of *m* peripheral elements, *m* being an integer greater than 1 and *n* an integer greater than 2, said elements being handled by an electric control unit, said network being of the type in which the state of each element may be expressed in the form of a binary digit collected on each of *m* separate channels, wherein said method comprises:

transmitting along *n* two-wire channels test pulses recurring in a recurrence interval, corresponding test pulses on the *n* two-wire channels being staggered as a function of time relative to one another by an interval equal at most to the nth part of the recurrence interval of said test pulses, each two-wire channel comprising means for decoupling d.c. potentials;

translating the state of an element *j* (*j* = integer variable from 1 to *m*) of any one of the *n* groups of *m* elements in the form of a loop state or non-loop state of a two-wire line connecting the network of *n* groups of *m* elements to the control unit, each "loop" state being synchronous with a test pulse; and

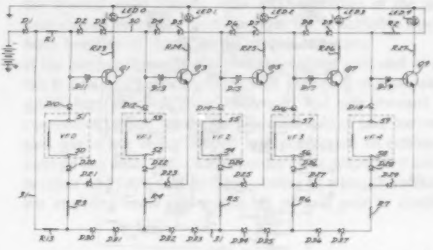
using the loop states for stopping the transmission of pulses through a receiver (R_j), the non-loop states releasing the same transmission.

4,045,623

SHORT CIRCUIT INDICATOR FOR A TERMINATOR MATRIX

Luis Albert Arce, 5875 Obispo, Long Beach, Calif. 90805

Filed May 3, 1976, Ser. No. 682,398
Int. Cl.[2] H04M *3/22*
U.S. Cl. 179—175.2 R **11 Claims**



1. An electrical circuit for detecting electrical shorts among matrix terminal points in an electrical circuit termination framework having at least two opposing D.C voltage power supply bus lines, wherein said terminal points are arranged in pairs with the individual terminal points within each pair connected to opposite ones of said power supply bus lines and with a load connected across each pair of terminal points and with at least a first terminal point in each pair maintained at a unique voltage potential relative to corresponding first terminal points in other pairs under normal conditions, comprising: transistor means associated with each of said terminal pairs, each transistor means having the base connection to said first one of the terminal points in the associated pair and having a collector-emitter connection between the second one of the terminal points in the same associated pair and the other one of the two aforesaid power supply bus lines; and current indicating means responsive to the collector-emitter current of each of said transistor means to indicate changes in flow of current therethrough.

4,045,624

CONTINUOUS MONITORING IN CARRIER TELEPHONE SYSTEMS

Sidney Browne, Falls Church, Va., assignor to Carrier Telephone Corporation of America, Inc., Falls Church, Va.

Filed Apr. 2, 1976, Ser. No. 672,934
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.3 R **9 Claims**

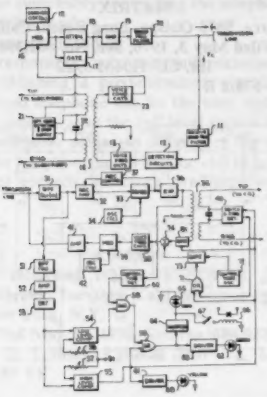
1. In a carrier telephone system of the type in which information is transmitted from a remote station to a local station as modulation of a first carrier frequency signal and information is transmitted from said local station to said remote station via a second carrier frequency signal, and in which there exists idle and busy operating modes, an arrangement for continuously monitoring operabiity of said system comprising:

means for transmitting said first carrier signal at a relatively high level during said busy mode and at a relatively low level during said idle mode;

means at said local station for detecting reception at said first carrier signal at said relatively low level;

means at said local station for detecting reception of said first carrier signal at said relatively high level; and

indicator means at said local station for providing a failure



indication in the absence of reception of said first carrier signal at at least said relatively low level.

4,045,625

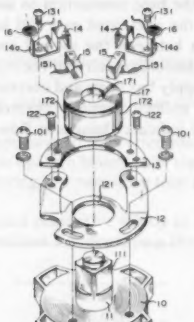
DISTRIBUTOR

Chin-Chin Tsai, 10, Lane 62, Te Kuang Street, Tainan, Taiwan, China /Taiwan

Filed Aug. 30, 1976, Ser. No. 718,546

Int. Cl.[2] H01H *19/00;* F02P *7/00*

U.S. Cl. 200—24 **3 Claims**



1. A rotary type distributor comprised of a central rotary shaft extending through a base means having a square collar provided on that extending end, a base plate disposed around said extending shaft end on said base means, a semicircular insulating ring disposed on said base plate, a rotary wheel of a non-conductive material keyed on the square collar of said rotary shaft and able to rotate in response to rotation of said shaft, said rotary wheel having a plurality of metal plates of equal length imbedded in the sides thereof in such a way that there is a gap provided between each two adjacent plates, two carriages having inverted U shaped portions, each carriage being disposed on said insulating ring and having an upwardly extending post on which is mounted a spring, two carbon brushes, each one of said brushes disposed in the inverted U shaped portion of one of said carriages and biased by said spring towards and in contact with the metal plates of the distributing wheel, the distance between the centers of the brush ends contacting said plates being less than the length of one of the plates, and the other ends of said brushes thereof not contacting the plates being connected by cables to positive and negative pole of an electrical source respectively, so that upon rotation of the wheel both carbon brushes come into contact with a single metal plate, setting up an electrical current, and upon further rotation of the wheel one of the gaps between the plates comes between the carbon brushes, causing the current to cease.

4,045,626

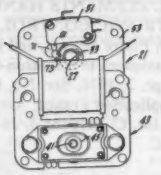
CAM-OPERATED MOTOR CONTROL SWITCH ASSEMBLY WITH IMPROVED AUXILIARY ACTUATOR FOR MOTOR CONTROL MICROSWITCH

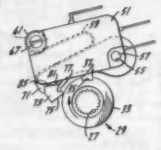
Frank Holper, Cary, Ill., assignor to Original Equipment Motors, Crystal Lake, Ill.

Filed Dec. 29, 1975, Ser. No. 645,241

Int. Cl.[2] H01H *43/12, 3/20;* H02P *3/00*

U.S. Cl. 200—30 R **1 Claim**





1. An electric motor assembly in which the motor is intermittently operated through cycles of similar duration, in which an output shaft is connected to said motor through a gear train located in a housing, and in which a switch controlling a holding circuit for said motor is located in an enclosure,

an actuating member for said switch movable between a holding circuit closing position and a holding circuit open position,

said switch actuating member extending out of said switch enclosure,

a cam synchronously rotatable with said shaft,

said cam being contoured to permit said switch actuating member to move to the motor holding circuit open position when said shaft is at the end of each cycle and to move said actuating member to the motor holding circuit closed position during the remainder of said shaft cycle,

a pawl pivotally mounted on a pin extending outwardly from said gear train housing with said pawl positioned to contact both said cam and said switch actuating member,

said switch enclosure being mounted on said pin and being located outwardly of said pawl, and

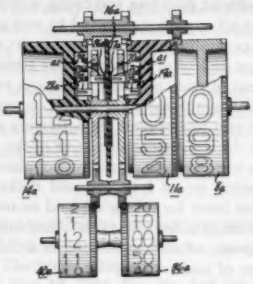
a U-shaped spring positioned between said gear housing and said switch enclosure, said spring engaging and biasing said pawl against said cam, said spring having a loop formed at the free end of one leg, a fastener extending through said switch enclosure and said loop to attach said switch enclosure and said spring to said gear train housing, the other leg of said U-shaped spring contacting said pawl.

4,045,627

SWITCHING MECHANISM FOR ALARMING TIME DETECTION IN AN ALARMING DEVICE

Kiyoshi Kitai, Tokyo; Masuo Ogihara, Chiba; Kouzo Sato, Chiba, and Nobuo Shinozaki, Chiba, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Apr. 4, 1975, Ser. No. 565,116
Claims priority, application Japan, Apr. 4, 1974, 49-38352
Int. Cl.[2] H01H *43/10;* **G04B** *23/10;* **G04C** *21/36*
U.S. Cl. 200—37 R **3 Claims**



1. An electrical switch device for detecting alarm times in an alarming device comprising: a one-piece switch part; first and second fixed switch parts each having a generally semi-ring shape and being disposed opposite and slightly spaced from one another to define a generally ring shape and being electrically insulated from each other by the slight spacing therebetween; an alarming circuit electrically connected to said first and second switch parts; first and second contact members each of which has a first contact part and a second contact part; a rotationally driven time wheel; a manually rotatable member settable to a desired angular position corresponding to the desired alarm time to be set; and alarm time detecting means engageable with said time wheel in accordance with the movement of said manually rotatable member and operable to detect the set alarm time; said one-piece switch part being fixed on one of said time wheel and alarm time detecting means and said first and second contact members being fixed on the other of said time wheel and alarm time detecting means; said first contact parts being disposed in superposed relation to and in engagement with said respective first and second fixed switch parts and said second contact parts being engageable with said one-piece switch part so that when said alarm time detecting means detects said set alarm time, said second contact parts are electrically connected with said one-piece switch part thereby electrically connecting said first and second fixed switch parts in series with said first and second contact members.

4,045,628

INTERLOCK FOR HANDLES OF ADJACENT CIRCUIT BREAKERS

John W. Schienda, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

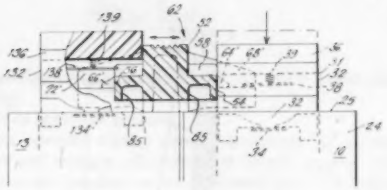
Filed Feb. 20, 1976, Ser. No. 659,670
Int. Cl.[2] H01H *9/26*
U.S. Cl. 200—50 C **13 Claims**

1. An interlock for preventing operation of one circuit breaker to the "on", contacts engaged position when an adjacent circuit breaker has been operated to the "on", contacts engaged position, wherein both adjacent circuit breakers are of the type having contact position controlling handles that are operated by pushing the handle of the circuit breaker into its casing, wherein the adjacent circuit breakers are aligned such that their corresponding terminals and handles are aligned in respective rows, and wherein the circuit breakers and their handles have front sides facing in the same direction and the handles of the adjacent circuit breakers each have a side facing toward a side of the handle of the other adjacent circuit breaker;

the interlock comprising:

a bar of a length to extend across the casing of each of the adjacent circuit breakers; said bar being located between the handles of the adjacent circuit breakers; said bar having opposite outwardly facing sides and being of a width between its said sides that is less than the distance between the spaced apart, facing sides of the handles of the adjacent circuit breakers, such that said bar is shiftable toward both handles of the adjacent circuit breakers;

said bar having opposite ends; at at least one said end of said bar is a pair of guide legs; one said guide leg of said pair of guide legs projects from each said bar side toward the respective circuit breaker at that said side of said bar; each said guide leg being shaped and positioned to rubbingly engage the front side of the handle of its respective circuit breaker and each said guide leg being of a length sufficient for enabling each said guide leg of said pair to continuously engage its respective circuit breaker handle front side throughout shifting of said interlock;



a respective handle motion obstructing leg located intermediate the length of said bar and projecting from each said side thereof; said handle motion obstructing legs being shiftable by shifting of said bar; each said handle motion obstructing leg being shiftable toward the circuit breaker handle on said side of said bar toward which that said handle motion obstructing leg extends; each said handle motion obstructing leg being so shaped and positioned as to block depression of the circuit breaker handle toward which that said leg extends;

said handle motion obstructing legs being of such length that when said bar is fully shifted toward and engages and is blocked from further shifting in that direction by one circuit breaker handle, said handle motion obstructing leg which is provided for blocking the handle of the other, adjacent circuit breaker is sufficiently away from that other circuit breaker handle as not to block depression of that handle.

4,045,629

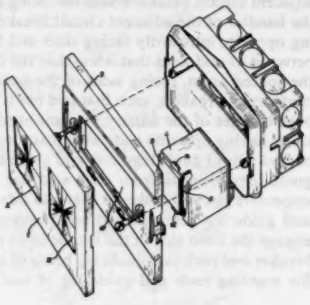
ELECTRICAL PROXIMITY SWITCH ARRANGEMENTS

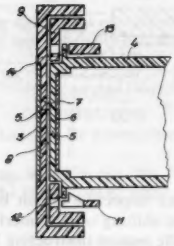
Alberto Anzani, Varese, Italy, assignor to Bassani Ticione S.p.A., Milan, Italy

Filed Apr. 8, 1975, Ser. No. 566,429
Claims priority, application Italy, Apr. 12, 1974, 21362/74
Int. Cl.[2] H01H *35/00, 9/00*
U.S. Cl. 200—52 R **7 Claims**

1. A proximity switch arrangement, comprising a support constituted of electrically-insulating material and having a front and a rear surface; a modular unit having a wall constituted of electrically-insulating material and facing said support; proximity switching means, including actuating means having an electrically-conductive touch plate fixedly mounted at said front surface of said support so as to remain substantially stationary relative to the latter when contacted by a user to thereby generate a signal indicative of such contact, detecting means having an electrically-conductive plate mounted at the inwardly-facing side of said wall which faces away from said support and operative for detecting said signal, and means

responsive to said detecting means for initiating transmission of said signal; mounting means for juxtaposing said plates in substantial spaced parallelism by mounting said unit on said supprt, to thereby form a capacitor with the electrically-





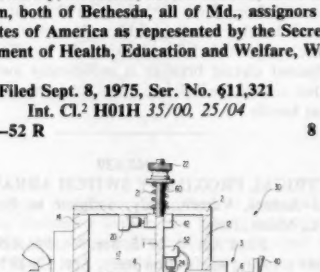
insulating materials serving as the dielectric, said electrically-insulating materials being operative for maintaining said plates apart and for maintaining said touch plate away from said transmission initiating means to thereby obtain maximum user safety.

4,045,630

CHIN ACTIVATED SWITCH

Charles J. McCarthy, Rockville; Steven Charles, and Daniel M. Eichenbaum, both of Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 8, 1975, Ser. No. 611,321
Int. Cl.[2] H01H *35/00, 25/04*
U.S. Cl. 200—52 R **8 Claims**



1. A device for controlling movement of an instrument along three orthogonal axes by movement of the chin of an operator, comprising:

a chin plate for placement against the chin of the operator;

motor means for driving the instrument along three orthogonal axes and controlled by the location of said chin plate; and

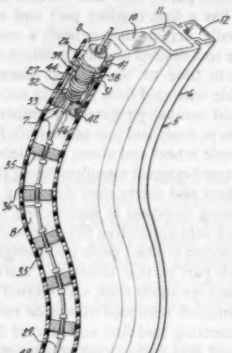
means for converting movements of said chin plate to signals for said motor means, comprising a pivot lever connected to and extending from said chin plate; a push rod lying within said pivot lever and extending from said chin plate, said push rod being sufficiently rigid to transmit push forces without buckling and being sufficiently flexible to bend; a rocker plate connected to said push rod and extending generally perpendicular thereto; support means to retain one end of said rocker plate stationary relative to movement of said chin plate, said push rod and said pivot lever; first switch means mounted on said support means adjacent said rocker plate for activating said motor means to move the instrument along one of the three orthogonal axes due to movement of said rocker plate; and second and third switch means lying on said rocker place adjacent said pivot lever for activating said motor means to move the instrument along two of the three orthogonal axes due to movement of said pivot lever in a direction parallel to the plane of said rocker plate.

4,045,631

TOUCH-SENSITIVE DOOR CONTROL SWITCH

Daryl L. Dann, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Apr. 2, 1976, Ser. No. 672,871
Int. Cl.[2] H01H *3/16;* **E05F** *15/00*
U.S. Cl. 200—61.43 **8 Claims**



1. A touch-sensitive control device for mounting on a vehicle door comprising:

a resilient tubiform door-edge housing having longitudinally extending distal and proximal end surfaces at the ends of its transverse cross section and distal and proximal portions extending therealong of which the distal portion is flexible and warpable with respect to the proximal portion when the proximal portion is rigidly supported, said housing having a flexible wall defining its distal side which encloses a longitudinal passageway;

an electrical switch and switch-operating assembly received in said passageway comprising: a plurality of spacer blocks spaced at operating position generally uniformly along said passageway; a cable extending substantially the full length of the passageway centrally through said blocks; a normally resiliently closed switch comprising a

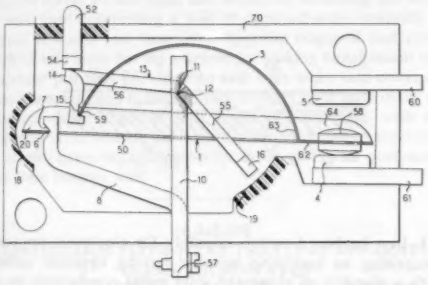
body supported in one end of the passageway, and an element movable within the body between positions for opening and closing an electrical circuit therethrough; anchor means fixed in the other end of said passageway gripping said cable; resilient and element-engaging means connected with a portion of said cable adjacent to the switch acting on the housing in the outward direction of said one passageway end to place the cable in a condition of continuous tension and to engage said element, and to hold said switch in one of said positions; and adjustable means in said assembly for adjusting said switch body and cable toward and away from each other while maintaining said cable under tension at undeflected condition of said distal housing portion, said body and cable being adjustable to a relative position to maintain said switch in said one position enabling said switch to assume the other of said positions upon a predetermined deflection of said distal portion of the housing and a corresponding shift in position of said cable portion.

4,045,632

QUICK MAKE AND BREAK SWITCH

Henri Pierrot, L'Isle d'Espagnac, France, assignor to La Telemecanique Electrique, France

Filed Dec. 19, 1975, Ser. No. 642,529
Claims priority, application France, Apr. 14, 1975, 75.11490
Int. Cl.[2] H01H *13/36*
U.S. Cl. 200—67 PK **3 Claims**



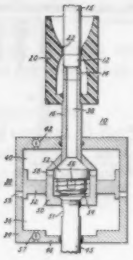
1. A quick make and break switch comprising, enclosed in a box: two fixed contacts and a movable contact; a fork-shaped support member having first and second branches located in a common plane and a lug connected to the said branches and forming a terminal for the movable contact; an inverter member carrying the movable contact and shaped as a comparatively rigid bracket having first and second ends and a longitudinal opening, said opening having first and second transverse edges, the first transverse edge being swivellingly supported at the end of said second branch remote from said lug; a rocking lever located in the said common plane, swivellingly supported on the end of the first branch remote from said lug and having on either side of the said first branch first and second arms respectively having first and second ends remote from the first branch; a push-button cooperating with the first end of the arms and placed above the first end of the inverter member whilst the second end of the arms is placed below the second end of the inverter member; a curved elastic blade having first and second ends respectively compressed between the first end of the arms and the second transverse edge of the opening, said elastic blade having a snap-on action on the inverter member for a predetermined position of the first end of said elastic blade, the second arm of the rocking lever being dimensioned and positioned, with respect to the inverter member end, for allowing mechanical engagement between the said second arm and the inverter member, after the first end of the elastic blade has passed beyond the said predetermined position.

4,045,633

GAS-BLAST ELECTRIC CIRCUIT INTERRUPTER OF THE PUFFER TYPE

Philip Barkan, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed June 27, 1975, Ser. No. 591,204
Int. Cl.[2] H01H *33/70*
U.S. Cl. 200—148 A **11 Claims**



1. A gas-blast electric circuit interrupter of the puffer type comprising:

a. a pair of separable contacts,

b. means operable during circuit-interruption for moving one of said contacts relative to the other to separate said contacts and produce an arc therebetween in the region between said contacts, said arc developing arcing products varying in pressure generally as a direct function of the arcing current,

c. a piston positively coupled to said one contact,

d. means cooperating with said piston for defining:

d_1. a pumping space at one side of said piston adapted to contain arc-extinguishing gas that is compressed by motion of said piston during a contact-separating operation and

d_2. a working space at the opposite side of said piston from said pumping space in which pressurized gas is adapted to act upon said piston in a direction to aid contact-separating motion of said one contact,

e. means defining a blast passage through which gas compressed in said pumping space can flow into said arcing region to aid in extinguishing said arc, said blast passage extending from said pumping space to said arcing region via a path effectively bypassing said working space,

f. auxiliary passage means affording communication between said blast passage and said working space,

g. and valve means effective during a low-current interrupting operation:

g_1. to block flow through said auxiliary passage means and

g_2. to allow free communication between said pumping space and said blast passage, whereby during a low-current interrupting operation compressed gas from said pumping space can flow into said arcing region via said blast passage at a predetermined point during contact-separation,

h. said valve means being effective when the pressure of said arcing products in the arcing region is high during a high-current interrupting operation:

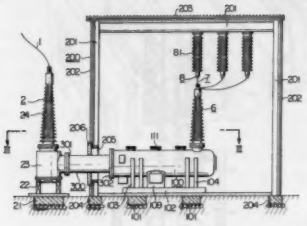
h_1. to allow flow through said auxiliary passage means into said working space, whereby during a high-current interrupting operation arcing products can increase the pressure in said working space, and

h_2. to block free communication between said pumping space and said blast passage, thereby decreasing contamination of the gas in said pumping space by said arcing products and reducing pressure build-up in said pumping space by said arcing products.

4,045,634
GAS INSULATED SWITCH-GEAR APPARATUS

Seizo Nakano; Kazuaki Oishi; Takehiro Kikuchi, all of Hitachi, and Syoetu Suda, Naka, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 13, 1976, Ser. No. 648,677
Claims priority, application Japan, Jan. 16, 1975, 50-6308
Int. Cl.[2] H01H *33/56*
U.S. Cl. 200—148 B 7 Claims

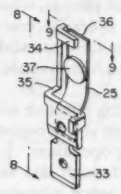


1. A gas insulated switch-gear apparatus comprising:
a gas insulated switch gear including power circuit breakers, disconnecting switches and earthing switches which are enclosed in earthed metallic vessels filled therein with insulating, arc-suppressing gas and electrically, mechanically associated with one another;
an input terminal and output terminal led out of said gas insulated switch-gear;
a switching house housing said gas insulated switch-gear;
a main bus bar insulatingly supported through insulators in said switching house; and
a connection bus bar connecting said main bus bar to one of the input terminal and the output terminal of said gas insulated switch-gear;
characterized in that:
a terminal bushing is provided separately of said switching house outside of the switching house and said terminal bushing is electrically connected to the other terminal of said gas insulated switch-gear by means of a gas insulated bus bar extending through the wall of said switching house.

4,045,635
ELECTRICAL SWITCH CONSTRUCTION AND IMPROVED OVERTRAVEL SWITCH BLADE THEREFOR AND METHOD OF MAKING THE SAME

Khiman K. Pursnani, Milford, and Roger P. Sepso, Stratford, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 22, 1976, Ser. No. 651,225
Int. Cl.[2] H01H *1/26*
U.S. Cl. 200—283 18 Claims

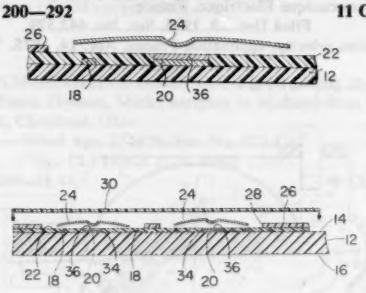


1. In an electrical switch construction having a housing means provided with an actuator for causing movement of a movable switch blade relative to an overtravel compensating fixed switch blade to effect an electrical switching operation, a rigid terminal being carried by said housing means and being secured to said fixed switch blade, said terminal having an extension thereof that is disposed in the path of movement of said fixed switch blade to limit movement of said fixed switch blade to limit movement thereof in one direction, said terminal having a first part thereof that is secured to said fixed switch blade and having a second part thereof that carries said extension thereof, said second part carrying said extension in a position to be out of the plane of said first part thereof, said fixed switch blade having opposed ends and having an electrical contact between said opposed ends thereof, the improvement wherein one of said ends of said fixed switch blade is secured to said first part of said terminal and the other of said ends is engageable with said extension of said terminal only at a point outboard of said contact.

4,045,636
KEYBOARD SWITCH ASSEMBLY HAVING PRINTED CIRCUIT BOARD WITH PLURAL LAYER EXPOSED CONTACTS AND UNDERSURFACE JUMPER CONNECTIONS

Alan C. Yoder, and John E. Weber, both of Fort Wayne, Ind., assignors to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Jan. 28, 1976, Ser. No. 653,226
Int. Cl.[2] H01H *9/00;* H05K *1/00*
U.S. Cl. 200—292 11 Claims



1. In a keyboard switch assembly for electronic apparatus comprising an insulative member having opposite surfaces with a plurality of elongated solid metal conductors on one said surface thereof, at least some of said conductors having enlarged portions thereon, at least some of said enlarged portions being switch terminals, and switch elements cooperating with respective switch terminals; the improvement wherein each of said switch terminals has a coating of conductive ink thereon to provide a switch contact area.

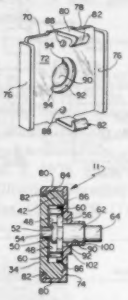
4,045,637
ELECTRICAL SWITCH ASSEMBLY HAVING TWO-PART HOUSING WITH COVER PART CONSISTING OF PLURAL FLANGES, INTERNAL ROTATION LIMIT STOP AND EXTERNAL BUSHING

Roland E. Mongeau, Cumberland, R.I., assignor to Tower Manufacturing Corporation, Providence, R.I.

Filed May 24, 1976, Ser. No. 689,520
Int. Cl.[2] H01H *21/04*
U.S. Cl. 200—303 4 Claims

1. In an electrical switch construction of the hollow-housing type having a recessed base of electrically insulative material and provided with a plurality of resilient contacts surrounding a rotatable contactor centered in said base and provided with a switch shaft upwardly projecting from said contactor whereby rotation of said shaft rotates said contactor through a limited turning radius so at to facilitate activation of varying electric circuits, said base having a bottom wall and surrounding upstanding side walls terminating in a peripheral face, the improvement comprising: and integral one-piece cover member formed of electrically insulative cover member formed of

electrically insulative material positioned in direct engagement solely with said recessed base so as to cooperatively form said hollow housing, said cover being of generally planar configuration including an internal face in opposition to said base and contacting said peripheral face of said base side walls, said cover having an external face, said cover having a generally centrally located opening therethrough, said shaft positioned through said opening and extending outwardly of said external face, limit integral with said cover and positioned in said internal face thereof and positioned about said opening to limit rotational movement of said shaft, mounting means integral



with said cover on said external face thereof for mounting said switch to a panel and means integral with said cover for attaching said cover to said base, said means for attaching said cover to said base comprising a pair of opposed arms inwardly directed towards said base from opposite edges of said cover, each of said arms having a detent for locking engagement with undercut portions provided on said base when said cover and base are assembled in face-to-face contact with each other and wherein those edges of said cover not provided with said opposed arms include an inwardly directed flange positioned in cooperative engagement with outer side wall portions of said base bottom wall.

4,045,638

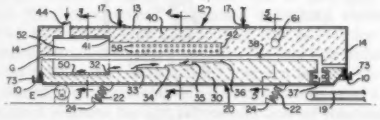
CONTINUOUS FLOW HEAT TREATING APPARATUS USING MICROWAVES

Bing Chiang, 3413 Dunnington Road, Beltsville, Md. 20705, and Alfred F. Hoyte, 7734 16th St. NW., Washington, D.C. 20012

Filed Mar. 9, 1976, Ser. No. 665,195

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 A **12 Claims**



1. Electrical apparatus for heat treating particulate materials passing in bulk through the apparatus from an input end to an output end thereof, comprising:

a conveyor pan elongated in the direction of travel of the materials;

drive means operative to vibrate said pan and impart to it a motion to advance said materials in said direction of travel;

an elongated cover over said pan having side and end walls closely spaced with respect to said pan;

cover support means for supporting said cover above said pan;

refractory heat insulation lining said pan, the insulation nearly filling the pan at a portion thereof near said output end but leaving a narrow shallow material conveying trough, the insulation partially lining the pan at a portion thereof near said input end but leaving a wider and deeper trough, and the depth and width of the insulation gradually increasing from the input end to the output end so that the trough becomes progressively narrower and shallower as it passes through the portion of the pan intermediate the input and the output portion;

refractory heat insulation in the cover graduated to increase in thickness and width from the input end to said output end so that the insulation in the cover converges on the trough to form therewith an air space which becomes progressively smaller;

electric heater means in the air space located in said input and intermediate portions and directed to heat materials in the trough;

a microwave generator; and

waveguide means coupled to the generator and extending through the insulation and directed to impinge microwave onto materials in the portion of the trough near said output end.

4,045,639

CONTINUOUS MICROWAVE AND VACUUM DRYER

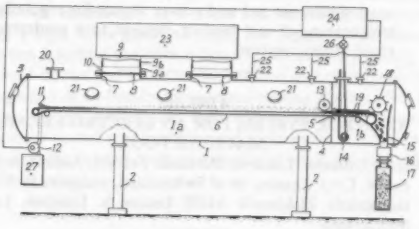
Nicolas Meisel, Epone, France, assignor to Food Processing Systems Corporation, Del.

Continuation-in-part of Ser. No. 432,814, Jan. 14, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,420

Claims priority, application Switzerland, Jan. 16, 1973, 570/73

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 A **8 Claims**



1. An apparatus for continuous microwave and vacuum drying a liquid containing material which comprises:

a. a housing forming a closed elongated space;

b. means for evacuating said closed space;

c. means impermeable to microwave energy for partitioning the closed space into first and second chambers, said partition having a slit therein;

d. an endless conveyor belt having a feeding end and a discharge end disposed longitudinally in the closed space and through the slit;

e. means for feeding on the belt a product containing a liquid to be evaporated;

f. at least one source of microwave energy fed into the first evacuated chamber through at least one adjustable microwave cavity at atmospheric pressure, microwave permeable but air tight membranes sealing the non-evacuated microwave cavity from said evacuated first chamber;

g. means disposed in the second chamber for absorbing microwaves which have passed through said slit; and

h. means for discharging the product from the apparatus.

4,045,640

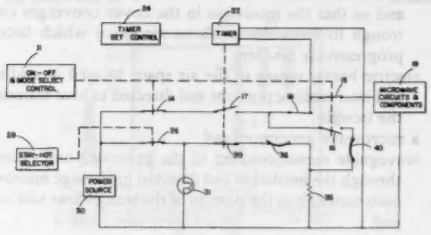
STAY-HOT CONTROL FOR MICROWAVE OVEN

Raymond R. McQueen, Jr., Hacienda Heights, and Christian E. Buerki, Fullerton, both of Calif., assignors to Norris Industries Inc., Los Angeles, Calif.

Filed Dec. 8, 1975, Ser. No. 638,890

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 B **5 Claims**



1. In a microwave oven including microwave cooking circuit means, a power source, a timer and switch means for connecting the power source to the cooking circuit means for a predetermined time period in response to said timer, and an infra-red heating element, the improvement whereby means are provided for automatically keeping the oven hot when said predetermined time period has elapsed comprising:

a first ("stay-hot") switch interposed between said power source and said heating element,

a stay-hot selector for operating said first switch to provide stay-hot operation,

a second switch interposed between said power source and said heating element and in series with said first switch, said second switch being closed and said switch means for connecting the power source to the cooking circuit means being opened in response to said timer, when said predetermined time period has elapsed, and

thermostatic switch means interposed in series between said heating element and said power source for regulating the temperature of said heating element to a predetermined stay-hot temperature.

4,045,641

CONTROL SYSTEM FOR AN ELECTRO-EROSION MACHINE TOOL

Werner Ullmann, Locarno; Bernardo Ferroni, Ascona, and Gideon N. Levy, Losone, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Dec. 16, 1975, Ser. No. 641,241

Claims priority, application Switzerland, Feb. 20, 1975, 2110/75

Int. Cl.[2] B23P 1/08

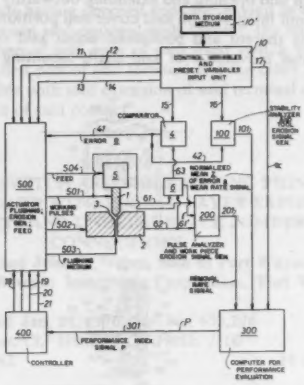
U.S. Cl. 219—69 C **7 Claims**

1. A control system for a machine tool of the kind in which electrical energy is passed across a working gap **(3)** between a tool electrode **(1)** and a workpiece **(2)** so as to machine the workpiece by eroding it, and having command means **(10, 10')** providing a signal indicative of a predetermined desired relationship between rate of erosion of the tool electrode and of the workpiece, respectively, the control system comprising:

tool erosion signal generator means **(100)** for forming a signal representative of the rate of erosion of the tool electrode **(1)**;

workpiece erosion signal generator means **(200)** for forming a signal representative of the rate of erosion of the workpiece **(2)**;

computer means **(300)** having first, second and third inputs **(101, 201, 17)** and an output **(301)**, the first and second inputs **(101, 201)** respectively being connected to the outputs of the tool erosion signal generator means **(100)** and the workpiece erosion signal generator means **(200)** to receive the signals formed thereby, and the third input **(17)** being connected to the command means, **(10, 10')** to receive a signal representative of a factor **(α)** which indicates a predetermined desired relationship of the rate of erosion of the tool electrode to the rate of erosion of the workpiece, said computer means **(300)** being operable for combining


DATA STORAGE MEDIUM
CONTROL VARIABLES AND PRESET VARIABLES INPUT UNIT
COMPARATOR
ERROR E
NORMALIZED MEAN E OF ERROR E & WEAR RATE SIGNAL
ACTUATOR FLUSHING EROSION GEN. FEED
REMOVAL RATE SIGNAL
PULSE ANALYZER AND WORK PIECE EROSION SIGNAL GEN.
FLUSHING MEDIUM
CONTROLLER
PERFORMANCE INDEX SIGNAL P
COMPUTER FOR PERFORMANCE EVALUATION

said tool erosion rate signal with said factor signal and said workpiece erosion rate signal with said factor signal to form, at its output **(301)**, an output signal (P) which has a value within a limited range and which is is indicative of the correspondence between the actual relationship and the said desired relationship of the rate of erosion of the tool electrode to the rate of erosion of the workpiece.

4,045,642

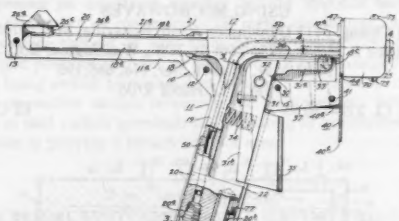
ELECTRODE HOLDER

John J. Driscoll, 422 S. 18th St., Allentown, Pa. 18104

Filed Jan. 26, 1976, Ser. No. 652,186

Int. Cl.[2] B23K 9/16

U.S. Cl. 219—70 **13 Claims**



1. In a hand-held tool for use in working metal by means of an electric arc; said tool including barrel means adapted to contain an elongated electrode; pistol grip means depending from said barrel; means actuated by a trigger carried by said pistol grip for releasably clamping said electrode in said barrel means with an exposed length of the electrode extending axially forward beyond the front end of said barrel means; means in said pistol grip for supplying electrical energy to said electrode in said barrel means; and rotary nozzle means located at the front of said barrel means for flowing a gaseous medium along the exposed length of the electrode; said nozzle means including a head having orifice means for ejecting said gaseous medium therefrom, means mounting said head to the front of said barrel means for rotation coaxial therewith, means for supplying said gaseous medium under pressure to said head,

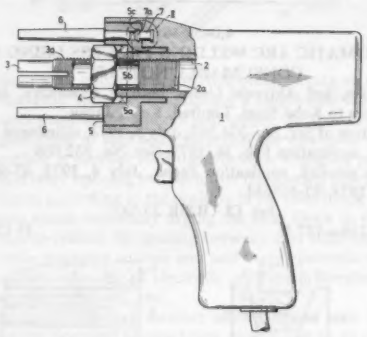
and annular manifold means located intermediate said supply means and said orifice means to provide gas communication between said supply means and said orifices; the improvement wherein said head has a front wall with an electrode receiving aperture and a tubular wall extending rearwardly from said front wall and surrounding at least a portion of said barrel means, means providing an outer seal compressible radially between said tubular wall and said barrel means to prevent escape of said gaseous medium rearwardly from said manifold means, and means providing an inner seal compressible axially between the front wall of said head and said head mounting means to prevent escape of said gaseous medium inwardly from said manifold means.

4,045,643

BOLT WELDING GUN

Walter Burkert, Munich; Walter Hopfer, Otterfing, and Karl Grasmugg, Munich, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 5, 1976, Ser. No. 655,570
Claims priority, application Germany, Feb. 10, 1975, 2505517
Int. Cl.² B23K *11/04*
U.S. Cl. 219—98 **11 Claims**



1. Bolt welding gun comprising a gun body having a front end from which bolts and the like are welded to a workpiece, a slide-in unit mounted within the front end of said gun body, said slide-in unit includes an axially extending front tubular part located within the front end of said gun body, a tubular bolt holder disposed in threaded engagement with and extending forwardly from said front tubular part and extending forwardly of the front end of said gun body, and supporting legs extending forwardly from the front end of said gun body, wherein the improvement comprises a locking element in operative association with said tubular bolt holder for fixing the relative threaded engagement between said bolt holder and said front tubular part, said locking element being a threaded nut in threaded engagement with said bolt holder, and a rotatable control element having a common axis of rotation with said threaded nut being arranged to laterally enclose at least a portion of the axial extent of said locking element for preventing the rotation thereof.

4,045,644

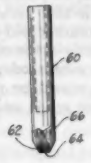
WELDING ELECTRODE AND METHOD OF MAKING

William M. Shafer, and Anil V. Nadkarni, both of Baltimore, Md., assignors to SCM Corporation, New York, N.Y.

Filed July 24, 1975, Ser. No. 598,844
Int. Cl.² B23K *11/30*
U.S. Cl. 219—119 **6 Claims**

1. A dispersion strengthened metal resistance welding electrode produced from consolidated dispersion strengthened metal extruded in an axial direction and having co-axial, anisotropic fibrous grain structure, the improvement comprising:

said resistance welding electrode having a welding tip portion wherein the grain structure is reorientated into a nonfibrous, isotropic grain structure formed by pressure-



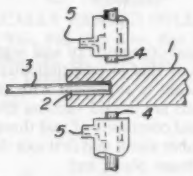
flowing said tip portion transversely to said axis to form the nonfibrous isotropic grain structure in said welding tip.

4,045,645

WELDING PROCESS FOR SLOTTED TUNGSTEN ROD

Robert S. White, Jr., Beverly, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 5, 1976, Ser. No. 664,342
Int. Cl.² B23K *11/16*
U.S. Cl. 219—118 **5 Claims**



1. In the process of connecting a refractory metal ribbon to a refractory metal rod having a diametrical slot at one end thereof, for embedment in a press seal of an electric lamp having a high silica glass envelope, the improvement which comprises inserting the ribbon into the slotted rod, making a first weld on the rod at about the internal end of the slot by closing a pair of electrodes thereon and passing electric current between the electrodes, and then making a second electric weld on the slotted portion of the rod at about the external end of the slot, the second weld closing the sides of the slot onto the ribbon.

4,045,646

POSITIONING FIXTURE FOR ROCK BIT WELDING

Carl Laurent Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 409,209, Oct. 24, 1973, abandoned.
This application May 29, 1975, Ser. No. 581,997
Int. Cl.² B23K *15/00*
U.S. Cl. 219—121 EB **4 Claims**

1. Apparatus for constructing a rotary rock bit by welding separate segments of the bit together with a beam of electrons along the seams between segments, said segments being positioned together in a composite with said seams being out of alignment with the central axis of the composite placing the gage cutting structure of the rock bit at the desired gage diameter, comprising:

a vacuum chamber;

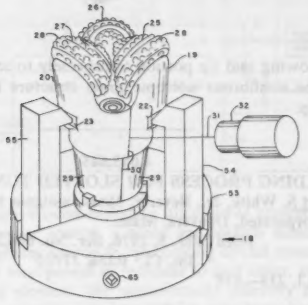
an electron beam gun for directing a beam of electrons into said vacuum chamber, said electron beam gun being connected to said vacuum chamber so that it will direct said electron beam into said vacuum chamber along a beam plane in a fixed position within said vacuum chamber;

means for urging said segments together into said composite with said gage cutting structure at the desired gage diame-

ter and the seams out of alignment with the central axis of the composite;

tilting means for tilting the composite of said segments about a first axis that will be parallel to said beam plane when said segments are in said vacuum chamber,

rotating means for rotating said composite of said segments about the central axis of the composite, said tilting means and said rotating means adapted to place a seam in a position where it would be parallel to said beam plane when said segments are in said vacuum chamber;



means for moving said composite of said segments laterally along a second axis that is perpendicular to said beam plane to place a seam in alignment with said beam plane when said segments are in said vacuum chamber;

means for moving said composite of said three segments into said vacuum chamber along said first axis thereby aligning a seam with said beam plane; and

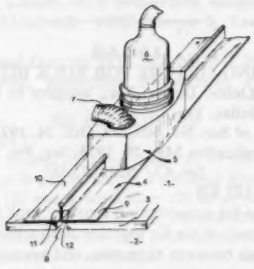
indexing means for indexing said segments through angular increments to sequentially bring additional seam planes into alignment with said beam plane.

4,045,647

FLUID TIGHT MOVABLE PASSAGE

Paul Thome, 8 rue Coutureau, Saint-Cloud Hauts-de-Seine, France

Filed Nov. 12, 1975, Ser. No. 631,403
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 EB **9 Claims**



1. A device for providing a vacuum-tight passage to a wall and displacing said passage along said wall following a predetermined rectilinear path, said device comprising

a flexible coupling comprising two static bands having an L-shape, symmetrically arranged with respect to said predetermined path, each band being provided with a first face and a second face perpendicular to each other, said first faces of said two bands being in permanent vacuum-tight connection with said wall on either side of said path, whereas said second faces face each other across said path and are deformable between a closed position wherein they are hermetically engaged with each other and an opened position wherein they are disengaged from each other;

a mobile chamber positioned astride said flexible coupling and displaceable along said predetermined path while in sliding sealing contact with the exposed surface of said bands across portions of said second faces in said closed position;

means to perform deformation of said bands inside said chamber from the closed position to the opened position near one end of the chamber and from the opened position to the closed position near another end of the chamber, thereby providing a passage through said flexible coupling inside said chamber;

removable clamping means for exercising a clamping action retaining the bands in the closed position of said flexible coupling outside the mobile chamber;

means for displacing said chamber with respect to said coupling along said path;

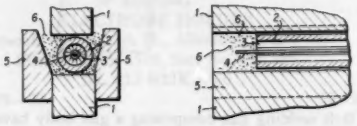
profiled guiding ribs formed on said second faces of said bands and cooperating guiding grooves of said mobile chamber for slidably and sealingly engaging said ribs, at least at the entrance and exit of the chamber.

4,045,648

AUTOMATIC ARC WELDING PROCESS USING A CONSUMABLE NOZZLE

Katsuro Iio, and Akiyoshi Osato, both of Kamakura, Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Continuation of Ser. No. 376,367, July 5, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,606
Claims priority, application Japan, July 4, 1972, 47-66948; Oct. 20, 1972, 47-105653
Int. Cl.² B23K *25/00*
U.S. Cl. 219—137 R **15 Claims**



1. An automatic arc welding process for butt welding together two vertically disposed base materials with the welding line in a horizontal plane, characterized in that said process comprises the steps of:

placing backing materials upon opposite sides of said welding line,

placing a longitudinal horizontal disposed consumable nozzle, which is coated with an insulating material disposed therearound and has a hollow core portion, along a horizontal welding line between said base materials,

continuously feeding a horizontally disposed welding wire through said hollow core portion at a rate faster than said nozzle is being consumed; and

generating arcs from both the consumable nozzle and the continuously moving welding wire to achieve deep penetration and to prevent the forward flow of the molten metal toward the nozzle enabling the formation of a large amount of deeply penetrated deposited metal.

4,045,649

HOLDER FOR CARBON ARC ELECTRODES

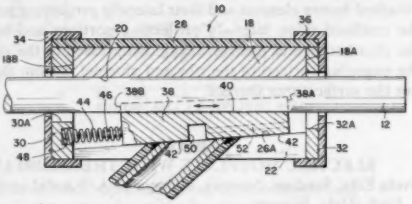
Paul B. Moss, Tulsa, and Gilbert L. Watson, Locust Grove, both of Okla., assignors to Paul B. Moss, Tulsa, Okla.

Filed Sept. 2, 1975, Ser. No. 609,705
Int. Cl.² B23K *9/28*
U.S. Cl. 219—143 **6 Claims**

1. A holder for a cylindrical carbon arc electrode, comprising:

an elongated body having a forward end and a rearward end, having an opening therethrough from the forward to the rearward end, and a slot in the bottom side communicating with the opening, the opening being configured in cross-section perpendicular the length of the body to provide an electrode engaging portion opposite said slot, and a slide block receiving portion spaced between said electrode receiving portion and said slot, the slide block receiving portion having opposed ledges to either side of said slot, the ledges being in a common plane tapering from one end of the body to the other;

an elongated slide block of electrically conducting material of length less than said body having a forward end and a rearward end, the slide block being slidably receivable in said body opening, the bottom thereof being in engagement with said ledges, the slide block having an electrode engaging upper surface having a lengthwise taper of the same angle as the taper of said ledges, the slide block being positioned in said body such that the electrode engaging surface is parallel with the electrode engaging portion of said body opening and such that the spacing therebetween varies according to the position of the slide block member;



spring means resiliently urging the slide block in the direction to reduce the spacing between said slide block electrode engaging surface and said body electrode engaging surface whereby an electrode positioned therebetween is securely retained; and

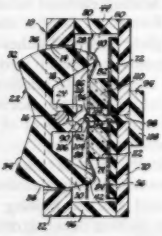
a current conducting member affixed to said slide block by which electrical conductivity can be had to an electrode received in said body.

4,045,650

JUMPER TOUCH SENSOR CURRENT SWITCHING DEVICE

Charles R. Nestor, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1976, Ser. No. 653,300
Int. Cl.² H01H *3/00*
U.S. Cl. 200—153 K **5 Claims**



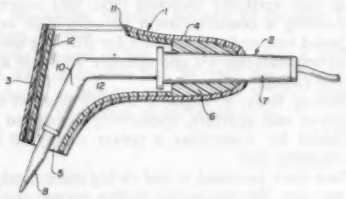
1. A printed circuit board switch comprising a housing having a cavity therein with a side opening, a cavity base, a planar printed circuit board having an end segment and a side extension, means forming spaced apart electrical conductor strips on said end segment and said side extension, means for electrically insulating said strips from each other and said housing, said end segment being juxtaposed with said cavity base and having a planar extent substantially congruous with that of said cavity base, said side extension being directed through said side opening for electrical connection of said conductor strips external of said housing, an electrically conductive contactor plate with straight unbent ends located within said cavity having a center pivot and contact ridges formed on said straight unbent ends thereof, a flexible pad of foamed electrical insulating material secured to the underside of said contactor plate and juxtaposed against said end segment to electrically insulate said plate from said conductor strips and actuator means bearing against said contactor plate to produce a neutral position compression of said pad, said actuator means being operative to shift said contactor plate into first and second pivoted positions to cause said contact ridges thereon to initially contact and then shift laterally of said conductor strips to produce a wiping action thereacross said pad yielding in shear to accommodate said lateral shift and in compression to produce an unbalanced force on said contactor plate for return thereof to a neutral position when said actuator means is released.

4,045,651

ELECTRICALLY HEATED SOLDERING DEVICE

Richard C. M. Koo, 845 39th Ave., San Francisco, Calif. 94121

Filed Jan. 28, 1976, Ser. No. 652,910
Int. Cl.² H05B *1/00;* **B23K** *3/04;* **B25G** *1/10*
U.S. Cl. 219—227 **3 Claims**



1. A soldering device comprising:

a housing made of heat insulating material, said housing having an open end, a closed end, and an intermediate opening, with the long axis of said housing including an obtuse angle and with the end opening and the intermediate opening being substantially aligned to provide with said housing a relatively straight, openended passageway and with the outer dimensions of said housing being so proportioned that the soldering device can beheld pencil-fashion with the portion of said housing between said open end and said intermediate opening grasped between the fingers and thumb of the hand with the portion of the housing between the intermediate opening and closed end resting on the back of the hand between the thumb and index finger;

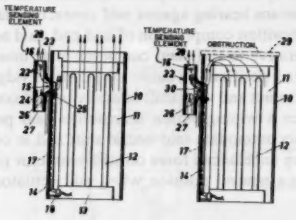
an electrically operated heating means including a solder contacting element and electric conductive means within said housing and spaced from said housing with the solder contacting element protruding through the open end of said housing and the electric conductive means connected to said solder contacting element, spaced from the housing and being fixed within the closed end of the housing, with said electrically operated heating means including an obtuse angle and positioned substantially coaxial with said housing; and

means to supply electrical energy to said electrically operated heating means.

4,045,652
DEVICE FOR PREVENTING OVERHEATING OF ELECTRIC APPARATUSES

Sven-Olof Janson, Svarvaregatan 6, Halmstad, Sweden (302 50)

Filed Sept. 3, 1975, Ser. No. 610,084
Claims priority, application Sweden, Sept. 4, 1974, 7409282
Int. Cl.[2] H05B 1/02; F24H 3/00, 9/20
U.S. Cl. 219—363 3 Claims



1. An apparatus for preventing overheating of electric heaters wherein said heater includes a casing having a front wall, a rear wall and side walls, a terminal block enclosed in said casing and a number of electric heating elements connected to and supported by said terminal block inside said casing, upper and lower apertures provided in said casing to define an air passage therethrough, said apparatus comprising:

an aperture formed in said casing at a position between said upper and lower openings;

an air channel arranged external to said casing between said upper and lower openings comprising a vertically disposed tube including an intermediate tube perpendicular to said vertically disposed tube, said intermediate tube forming a communication between said vertically disposed tube and said aperture for allowing said air channel to communicate via said aperture with said air passage of said casing;

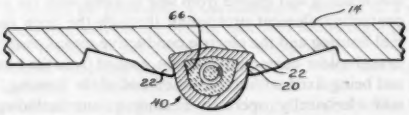
a sensing body, arranged in said air channel at a position above said aperture, operatively connected to a switch means for controlling a power supply to said heating elements; and

a flow duct, provided in said casing immediately below said aperture, for preventing, during normal operation of the electric apparatus, heated air from the interior of said casing from reaching said sensing body in said air channel through said aperture, said aperture and said flow duct being formed by a longitudinal slot in one wall of said casing, said aperture allowing heated air to flow over said sensing body in the event said upper opening is obstructed.

4,045,653
ELECTRIC COOKER WITH PRESS-STAKED HEATING ELEMENT AND METHOD OF MAKING THE SAME

LaVern G. Soper, Eau Claire, and Brent W. Dressel, Elk Mound, both of Wis., assignors to National Presto Industries, Inc., Eau Claire, Wis.

Filed June 28, 1976, Ser. No. 700,110
Int. Cl.[2] F27D 11/00
U.S. Cl. 219—438 9 Claims



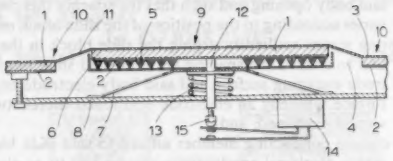
1. A method of staking a sheather electric heater element to the wall of a cooker comprising displacing metal from one side of the cooker wall to create an irregular channel with upstanding ribs along the two sides thereof, locating the sheathed heater element between the ribs and folding the ribs inwardly against the sides of the heater element therebetween while applying counter pressure to the opposite side of the cooker wall such that the confined portions of the heater element are conformed throughout their area to the thus engaged surfaces of the channel bottom and inner surfaces of the ribs.

9. A electric cooker having a wall of wrought metal provided with an irregular channel in one side thereof, and a sheathed electric heater element fixed in said channel, the channel having a bottom wall of shallow vee-shape in cross-section located interiorly of the cooker wall, the heater element having laterally projecting portions along the length of its two sides adjacent its base, and ribs at each side of the channel which project outwardly of the cooker wall and have inner surfaces in overlying engagement with the sides of the sheathed heater element and their laterally projecting portions, the confined sides, laterally projecting portions and basee of the sheathed heater element being compressed to the shape of the engaging surface of the ribs and channel bottom throughout the surface area thereof.

4,045,654
ELECTRIC HOTPLATE WITH THERMOSTAT

Svein Eide, Sandnes, Norway, assignor to A/S Ardal og Sunndal Verk, Oslo, Norway

Filed Sept. 1, 1976, Ser. No. 719,506
Claims priority, application Norway, Sept. 2, 1975, 752999
Int. Cl.[2] H05B 3/68
U.S. Cl. 219—449 9 Claims



1. A thermostatically controlled electric hotplate comprising:

a horizontally aligned heating plate formed of thermally expandable material;

an unheated zone surrounding said heating plate;

electric heating element means, positioned beneath said heating plate, for, upon energization of said electric heating element means, heating said heating plate to cause horizontal expansion thereof, said heating plate being capable of horizontal contraction upon deenergization of said electric heating element means;

bridge means, formed of flexible sheet material connecting said heating plate with said unheated zone, for transforming said horizontal expansion into upward vertical movement of said heating plate relative to said unheated zone and for transforming said horizontal contraction into downward vertical movement of said heating plate relative to said unheated zone;

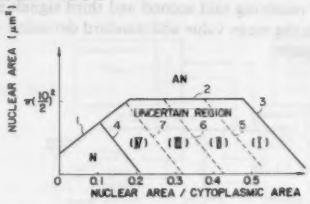
a switch electrically coupled to said electric heating element means, said switch having a closed position causing energization of said electric heating element means and an open position causing deenergization of said electric heating element means; and

actuating member means, mechanically coupled to said heating plate and to said switch, for transmitting upward vertical movement of said heating plate to said switch to move said switch to said open position thereof and for transmitting downward vertical movement of said heating plate to said switch to move said switch to said closed position thereof.

4,045,655
AUTOMATIC CYTO-SCREENING DEVICE

Ryuichi Suzuki, Kokubunji, and Takaji Suzuki, Kashiwa, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 514,925, Oct. 15, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,381
Claims priority, application Japan, Oct. 15, 1973, 48-114819; Oct. 15, 1973, 48-114818; Oct. 22, 1973, 48-117962; Oct. 26, 1973, 48-119876; Jan. 30, 1974, 49-11886; June 24, 1974, 49-71333
Int. Cl.² G06M *11/04*
U.S. Cl. 235—92 PC **2 Claims**

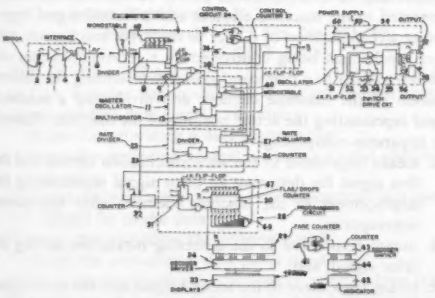


1. An automatic cyto-screening device comprising
magnifying means for optically magnifying a sample including cells;
scanning means for scanning a magnified image of the sample;
a cell detector for detecting a cell in the magnified image from a video signal obtained from said scanning means; and
diagnosis logic means for obtaining a morphologic feature of the cell as a diagnosis parameter from said image signal based on an output from cell detector,
characterized in that said diagnosis logic means further comprises
an area calculating means for calculating the nuclear area, cytoplasmic area and area of the nucleus with a predetermined density;
means for calculating the nuclear area/cytoplasmic area ratio; and
first classification means for determining to which region of a plurality of prescribed regions including normal abnormal, and uncertain prescribed regions the cell belongs based on said nuclear area and said ratio.

4,045,656
TAXIMETERS

Keith Scott, Auckland, New Zealand

Filed Mar. 5, 1976, Ser. No. 664,253
Int. Cl.² G07B *13/00*
U.S. Cl. 235—92 TC **4 Claims**

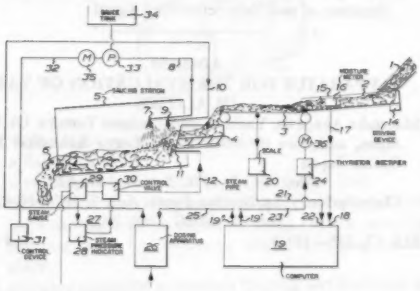


1. A taximeter for calculating a fare total from a predetermined combination of charges based on distance and/or time factors, said taximeter comprising a constant frequency oscillator adapted to emit a first pulse train; and a transducer adapted to emit a second pulse train proportional to the speed of the taxi; means for modifying said first pulse train to conform to the frequency of the said second pulse train when the frequency of said second pulse train exceeds a predetermined limit, said modifying means including a flip flop and a nand gate in circuit with said oscillator, said second electrical pulse train being applied in use to said flip flop, the output of which is connected to said nand gate and hence to said oscillator the output of which is fed back to said flip flop so that in use each pulse issuing from said oscillator fixes said flip flop in the reset state causing said nand gate to prevent said distance pulse train triggering said oscillator until said second pulse train exceeds a predetermined frequency whereupon more than one pulse from said second pulse train appears between two pulses of said first pulse train, the first of said pulses from said second pulse train setting said flip flop to prepare said nand gate to pass the second of said pulses from said second pulse train, which pulse then triggers said oscillator terminating the relaxation period thereof and causing a pulse in said first pulse train to issue from said oscillator conforming with said second pulse from said second pulse train, said taximeter including activation means adapted on operation to activate the taximeter, counting means for counting directly or indirectly the sum of pulses issuing from said time function and display means adapted to display the fare resulting from the sum of pulses counted by said counting means in a convenient form.

4,045,657
METHOD OF FACILITATING EXACT EVALUATION OR CONTROL OF THE PROCESSING OF A PRODUCT MASS, AND APPARATUS FOR CARRYING SAID METHOD INTO EFFECT

Erik Falke, Stockholm, Sweden, assignor to Svenska Tobaks Aktiebolaget, Sweden

Continuation-in-part of Ser. No. 476,262, June 4, 1975, abandoned. This application Dec. 30, 1975, Ser. No. 645,329
Claims priority, application Sweden, June 7, 1973, 7308021
Int. Cl.² G06F *15/46;* **A24B** *9/00*
U.S. Cl. 235—151.1 **11 Claims**

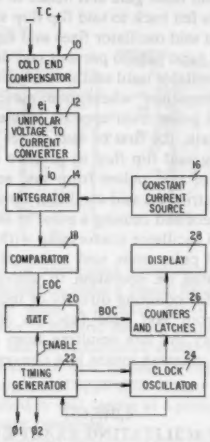


9. An apparatus for measuring the actual value of the weight and the moisture content of a product mass during transport of said mass from one location to another, said apparatus comprising at least one conveyor for conveying the mass, a moisture meter for continuously measuring the magnitude of a parameter related to the moisture content as a measure of the moisture of the mass, a weigher in close proximity to said moisture meter for continuously measuring the weight of the mass, a computer, and means for transmitting moisture and weight measuring set inputs and signals to said computer to make the computer establish thereby, on the basis of said measuring signals control signals related to the dry weight of the mass as demand signals for supplying at a location downstream of said conveyor additional material into the mass to desired values of the mass.

4,045,658
DIGITIZED LINEARIZING CORRECTION APPARATUS WITH FREQUENCY MODULATION

Veikko K. Peltola, and James M. Duros, both of Chicago, Ill., assignors to Alnor Instrument Co., Niles, Ill.

Filed Jan. 12, 1976, Ser. No. 648,463
Int. Cl.[2] H03B 3/04
U.S. Cl. 235—151.3 12 Claims



1. A method of linearizing the output signals produced by an analog measuring instrument including the steps of:

converting each of said output signals into a time referenced signal;

generating clock pulses of a first frequency; counting said clock pulses;

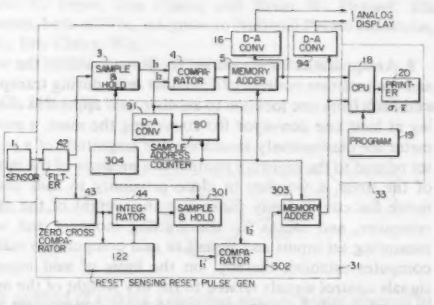
changing said first frequency to a second frequency at least at a first predetermined count; and

obtaining the number of clock pulses generated during the duration of said time referenced signal.

4,045,659
APPARATUS FOR THE EVALUATION OF YARN QUALITIES

Masatake Akagawa, Yachiyo, and Tsutomu Tamura, Oi, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 7, 1976, Ser. No. 674,828
Claims priority, application Japan, Apr. 7, 1975, 50-42056
Int. Cl.[2] G06G 7/66, 7/12
U.S. Cl. 235—151.3 4 Claims



1. An apparatus for evaluating the characteristics of a continuous yarn, said apparatus comprising:

a. sensor means for sensing a property of the yarn and for producing a first signal in response thereto;

b. first circuit means coupled to said sensor means for receiving said first signal and for producing a second signal which is a function of the amplitude component frequency distribution of said first signal;

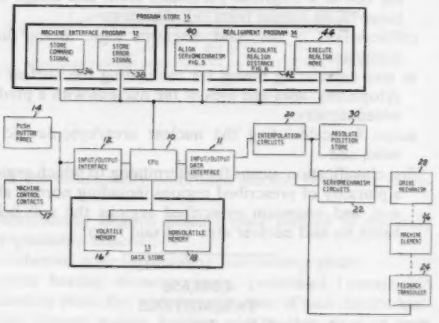
c. second circuit means coupled to said sensor means for receiving said first signal and for producing a third signal which is a function of the frequency component frequency distribution of said first signal; and

d. calculating means coupled to said first and second circuit means for receiving said second and third signals and for calculating the mean value and standard deviation of each of said signals.

4,045,660
METHOD AND APPARATUS FOR AUTOMATICALLY REALIGNING A MACHINE ELEMENT TO A PREDETERMINED POSITION AFTER POWER INTERRUPTION

William Robert Weisgerber, Springdale, and Ralph Charles Taylor, Westchester, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 29, 1976, Ser. No. 681,573
Int. Cl.[2] G05B 19/18; G06F 15/46
U.S. Cl. 235—151.11 15 Claims



1. An apparatus for automatically realigning a machine element to a commanded position in response to a first signal representing an interruption of power to a drive mechanism connected to the machine element and a second signal representing a reapplication of power to the drive mechanism, said drive mechanism being controlled by a servomechanism circuit responding to a command signal representing the desired position of the machine element and producing a feedback signal representing the actual position of the machine element, the apparatus comprising:

a. means responsive to the servomechanism circuit and the first signal for detecting an error signal representing the displacement of the machine element after the power interruption;

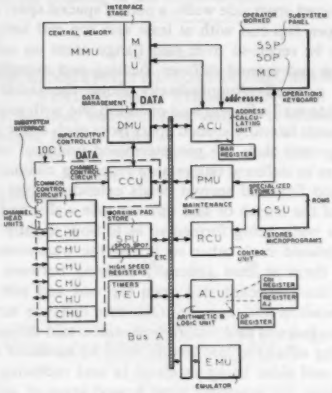
b. means responsive to the detecting means for storing the error signal; and

c. means responsive to the second signal and the error signal for producing a command signal to the servomechanism circuit to cause the machine element to move to the commanded position it had at the time of the interruption of power.

4,045,661
APPARATUS FOR DETECTING AND PROCESSING ERRORS

Pierre Gabriel Antoine, Palaiseau; Jean-Claude Marcel Cassonnet, Conflans-Ste-Honorine, and Daniel Rene Vinot, Villepreux, all of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 23, 1975, Ser. No. 570,743
Claims priority, application France, Apr. 25, 1974, 74.14488
Int. Cl.[2] G06F *11/06*
U.S. Cl. 235—153 AC **3 Claims**



1. In a data processing system comprising a central processor including functional devices capable of executing instructions stored in a memory, and means for detecting errors, improved apparatus for handling the detected error, comprising:

a first register having a plurality of bit locations, each of said functional devices being connected to one of said bit locations so as to permit the location and detection of errors; and

a second register operatively connected to selected of said functional devices, which are subject to several types of error for determining in which of said functional devices the detected error has occurred.

4,045,662
SELF TESTING MONITORING APPARATUS FOR MULTIPLEXED DIGITAL INPUT SIGNALS

Joseph T. Scopaz, North Bergen, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 29, 1976, Ser. No. 671,203
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—153 A **8 Claims**

1. A monitor for monitoring a digital address signal and corresponding data signal, comprising:

means for providing a data parity signal;

means for providing a signal indicating a valid address transmission;

means for providing a signal corresponding to a predetermined bit of the data signal;

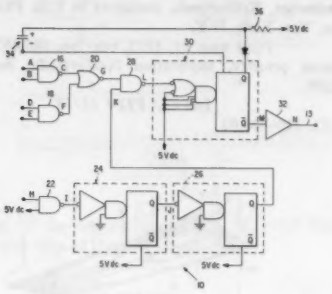
means for providing the address signal;

means for providing a data clock signal;

means for combining the data parity, valid address transmission, predetermined data bit and address signals and for providing a first signal;

means for providing a signal at a predetermined constant level;

means responsive to the data clock signal and the signal at the predetermined constant level for providing a second signal; and

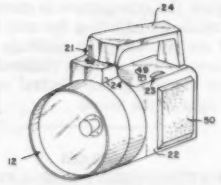


means responsive to the first and second signals for providing a monitor output signal.

4,045,663
RECHARGEABLE FLASHLIGHT ASSEMBLY

Danny J. Young, Tyler, Tex., assignor to James W. Fair, Tyler, Tex.

Filed June 16, 1976, Ser. No. 696,820
Int. Cl.[2] F21L *7/00;* **H04B** *1/08*
U.S. Cl. 240—10.6 CH **14 Claims**



1. A flashlight assembly comprising

a. a flashlight bulb,

b. a rechargeable battery for energizing said bulb,

c. circuitry for providing recharging of said battery, including a charger input, a current limiting resistor, and a light emitting diode for indicating when recharging is taking place,

d. circuitry means for selectively flashing said flashlight bulb or permitting continuous operation thereof, said circuitry means including an internal light source, a photocell for receiving light from said internal light source, and a first switch for selectively operatively connecting said internal light source to said battery to thereby provide flashing of said flashlight bulb, or to disconnect said internal light source from said battery whereby no flashing of said flashlight bulb occurs,

e. an accessory device powered by said battery,

f. a second switch for selectively operatively connecting said accessory device to said battery,

g. a casing operatively mounting and containing elements (a)–(f) above, and

h. a handle affixed to said casing for facilitating ready manipulation and utilization of said flashlight bulb and said accessory device.

4,045,664

LIGHTING FITTING PROVIDED WITH AT LEAST TWO-LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMPS

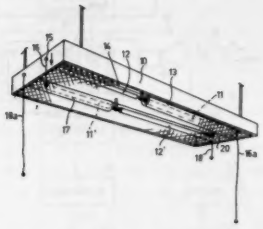
Louis Eugéne Vrenken, and Pieter Hendrik Broerse, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1972, Ser. No. 285,457

Claims priority, application Netherlands, Sept. 4, 1971, 7112208

Int. Cl.[2] F21V *11/18*

U.S. Cl. 240—46.03 6 Claims



1. An arrangement for providing illumination of selectable color value comprising:

a lighting fitting;

two low-pressure mercury vapor discharge lamps disposed within said fitting and having different color points, the color temperatures of the lamps being between 2500° and 7000° Kelvin, said lamps also having a color rendering index Ra8 of more than 80 and having a functional relationship wherein the line of connection between the color points of the two lamps in the color triangle located relative to the line of the black body is such that the color rendering index Ra8 of the combined light of the lamps radiating from the arrangement is more than 80;

and control means for adjusting the ratio of the light contributions of the two lamps to maintain an approximately constant lumen value of light radiated by said arrangement while modifying the spectral composition of the combined light of the lamps.

4,045,665

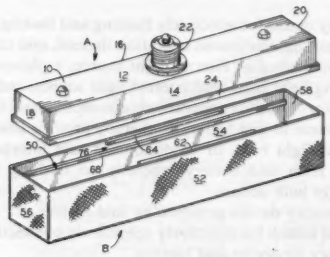
DIFFUSER ATTACHMENT FOR A FLUORESCENT LAMP FIXTURE

Harrison L. Williams, Euclid, and Detre M. Banhidy, Lakewood, both of Ohio, assignors to Preformed Line Products Co., Cleveland, Ohio

Filed June 25, 1975, Ser. No. 590,307

Int. Cl.[2] H05B *33/02*

U.S. Cl. 240—51.11 R 7 Claims



1. In a self-contained fluorescent lamp fixture of the type having a box-like fixture body adapted to support a fluorescent light tube and receive its operative components in operative association with fixture mounting means wherein the fixture body has a pair of opposed sides between which an open end of said fixture body is defined and with each side including an outwardly protruding flange area having a predetermined width extending longitudinally therealong, a cover member of substantially U-shaped cross-sectional configuration including a base having integral legs extending substantially perpendicularly from the opposite sides thereof, said cover member being attached to said fixture body with said base spanning said open end of said fixture body and with said sides of said fixture body positioned between said legs and closely received thereagainst so that said legs define said flange areas, a light diffuser attachment for said fluorescent lamp fixture, said diffuser having a generally box-like configuration including a bottom wall, a pair of spaced apart side walls, a pair of spaced apart end walls and an open top end with at least said top end being dimensioned to be received over said flange areas on said fixture body; first and second diffuser locating and mounting beads disposed generally longitudinally along the inside of each diffuser side wall adjacent said open top end with said first and second beads laterally spaced apart from each other a distance slightly greater than the predetermined width of said flange areas so as to define a flange area receiving channel therebetween, said first and second beads extending over at least a portion of the length of said diffuser side walls; and, said diffuser side walls being formed so as to bow slightly arcuately inward toward each other such that the transverse distance between them at least generally midway between said end walls at least adjacent said open top end and said first and second beads is less than the transverse distance between the outside surfaces of said fixture body sides, said diffuser attachment being affixed to said fixture body by means of the flange areas of said sides being received in said receiving channels with at least the inwardly most bowed areas of said diffuser side walls applying a continuous clamping force against said fixture body sides, and with said flange areas received between said first and second beads on said sidewalls over a distance less than the longitudinal length of each said diffuser sidewalls.

4,045,666

HEADLAMPS

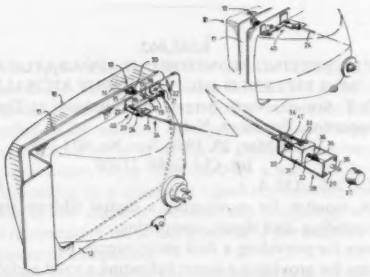
Roy Ernest Stringer, Birmingham, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Dec. 29, 1975, Ser. No. 644,517

Claims priority, application United Kingdom, Jan. 6, 1975, 487/75

Int. Cl.[2] B60Q *1/06*

U.S. Cl. 240—61.8 10 Claims



1. An adjustable headlamp assembly for a motor vehicle comprising a headlamp, means for mounting the headlamp for tilting movement about a first axis extending normally to the direction in which the headlamp is focussed, resilient means for biassing the headlamp in one direction of tilt about said axis and a Bowden cable mechanism for pulling the headlamp in the opposite direction, said Bowden cable mechanism having an outer sheath with opposite ends, and an inner cable with opposite ends, means for anchoring the ends of the sheath against

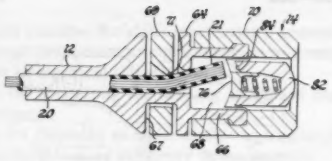
movement, one end of the inner cable being connected to the headlamp at a location spaced from the axis about which the headlamp tilts and the other end of the inner cable being connected to an adjustment device disposed remote from the headlamp and adapted to be operated from the interior of the motor vehicle for adjusting the position of the inner cable with respect to the outer sheath, the adjustment device comprising an anchorage fixed on the cable, a mounting for the anchorage for supporting the anchorage for linear sliding movement so as to move the cable linearly and screw means engaged with the anchorage for adjusting the position of the anchorage with respect to the mounting with the headlamp being adjusted in relation to the rotation of the screw means.

4,045,667

COLOR-SENSITIVE PHOTOELECTRIC CONTROL SYSTEM WITH FIBER OPTICS

Richard J. Hanson, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 26, 1976, Ser. No. 690,188
Int. Cl.² G01J *3/34*
U.S. Cl. 250—226 **3 Claims**



1. In a vehicle having a plurality of switching functions manually and remotely controlled at a control location, an optical control system comprising,

a light source,

a receiver sensing light from the light source,

a manually controlled optical selector at the control location intervening between the light source and the receiver for modifying the light spectrum sensed by the receiver, the selector comprising a plurality of different color filter means each effective when selected for modifying the illuminating light to provide a unique light spectrum corresponding to a given switching function, and

the receiver including a spectral analyzer responsive to the spectrum of the filtered light, and further including electrical switching means controlled by the analyzer to energize any of a plurality of switching functions corresponding to the selected spectrum, whereby the swtiching functions are controlled by manual selection of the color filter means.

4,045,668

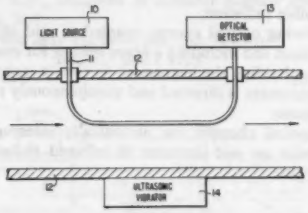
METHOD AND APPARATUS FOR IMMISCIBLE LIQUIDS MEASUREMENT

Gillies D. Pitt, Harlow, and Philip W. Black, Bishops Stortford, both of England, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,338
Claims priority, application United Kingdom, Aug. 21, 1975, 34778/75
Int. Cl.² G02B *5/14*
U.S. Cl. 250—227 **8 Claims**

1. A method of measuring the proportion of a first liquid dispersed in a lower refractive index second liquid with which the first is immiscible, comprising:

monitoring the optical attenuation through a length of optical attenuation through a length of optical fiber having an unclad region immersed in the liquids dispersion, said which unclad region having a refractive index greater



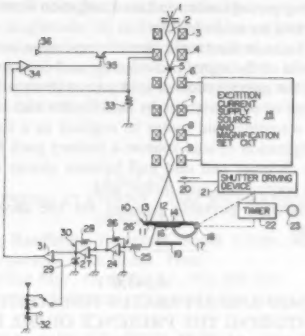
than that of the second liquid but not more than 0.1 greater than that of the first liquid.

4,045,669

ELECTRON MICROSCOPE

Shoji Kamimura, Katsuta, and Yasushi Saito, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,664
Claims priority, application Japan, Aug. 13, 1975, 50-97566
Int. Cl.² H01J *37/26*
U.S. Cl. 250—311 **12 Claims**



1. An electron microscope comprising means to radiate an electron beam, means to condense said electron beam from the radiation means onto a specimen, means to magnify the electron beam having been transmitted through said specimen by condensing said electron beam onto said specimen, means to convert the magnified electron beam into a visual specimen image, means to detect said magnified electron beam and to convert it into an electric signal, and means to control the condensing means in response to said electric signal so that a quantity of electrons per unit area in said magnified electron beam is held substantially constant.

4,045,670

PORTABLE PRECISION RADIOMETER

Alan S. Anderson, Littleton, and John J. Cardarelli, Malden, both of Mass., assignors to Williamson Corporation, Concord, Mass.

Filed Sept. 24, 1976, Ser. No. 726,446
Int. Cl.² G01J *1/00*
U.S. Cl. 250—338 **8 Claims**

1. A portable, precision, non-contact temperature measuring radiometer comprising:

illuminated visual meter means for registering the temperature measured by said instrument;

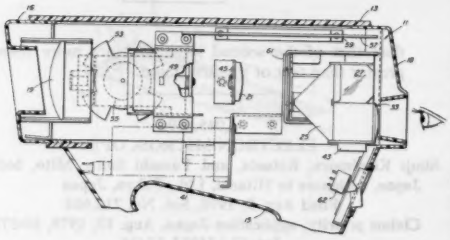
a detector responsive to infrared radiation;

an objective optical system for collecting both visible and

infrared radiation from a target, the temperature of which is to be measured, said objective system including a wavelength sensitive beam splitter for diverting infrared radiation toward said detector on a path separate from the visible radiation;

a viewing optical system coupled to said objective optical system and including a beam splitter for enabling an operator holding the instrument to view a target at which the instrument is directed and simultaneously read said meter means;

an optical chopper for periodically interrupting the incidence on said detector of infrared radiation from said target;



a controllable reference source for illuminating said detector during periods when infrared radiation from said target is blocked by said chopper;

a null balance electronic circuit responsive to the a.c. component of the signal provided by said detector for controlling the energization of said source to equalize the illumination of said detector by said source and said target and for actuating said meter to register as a function of the energization of said source; a battery pack for energizing said chopper and said null balance circuit together with said source and said meter; and

a lightweight portable housing for the aforesaid components.

4,045,671

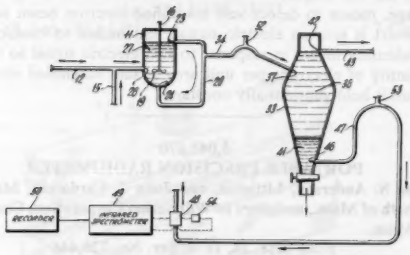
METHOD AND APPARATUS FOR CONTINUOUSLY MONITORING THE PRESENCE OF OIL IN WATER

Roger M. Dille; Merle H. Van Stavern, both of Richmond; Don L. Shull, Waynesboro, and David F. Gripshover, Richmond, all of Va., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,174

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—341 **8 Claims**



1. A system for continuously monitoring the presence of oil in water, comprising in combination

means for mixing a predetermined proportion of an oil-solvent with said water to form a chemical solution containing any oil therein, comprising means for combining streams of said water and said solvent in said predetermined proportions, and means for stirring said combined streams without producing a stable emulsion, also means for circulating said combined and stirred mixture,

means for diverting a portion of said circulating mixture,

a settling container for separating said diverted portion into said solution and said water,

said solvent does not have significant infrared absorbency at a predetermined infrared wavelength and has a different density from said water,

an infrared spectrometer for determining the presence of oil in said solution, and

means for flowing said separated solution past said infrared spectrometer.

4,045,672

APPARATUS FOR TOMOGRAPHY COMPRISING A PIN HOLE FOR FORMING A MICROBEAM OF X-RAYS

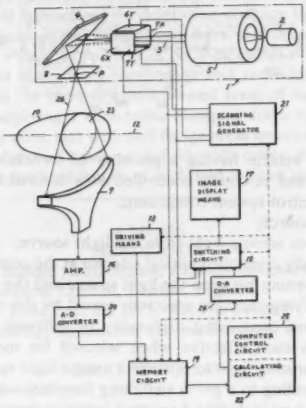
Eiji Watanabe, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 3, 1976, Ser. No. 720,409

Claims priority, application Japan, Sept. 11, 1975, 50-110230; Sept. 11, 1975, 50-110231; Dec. 19, 1975, 50-152074; Feb. 5, 1976, 51-11591; Feb. 28, 1976, 51-21711; Mar. 5, 1976, 51-23997

Int. Cl.[2] A61B *6/02*; G01N *23/08*; G03B *41/16*; H05G *1/30*

U.S. Cl. 250—360 **14 Claims**



1. An apparatus for obtaining a two dimensional display of the X-ray absorption distribution on a cross-sectional plane of an object comprising:

a. means for generating an electron beam,

b. means for focusing said electron beam on a target thereby generating X-radiation at the location of impingement,

c. a guide plate having a pin hole therein for forming and directing an X-ray microbeam onto the object,

d. means for scanning said electron beam over the surface of the target to cause the X-ray microbeam to correspondingly scan a cross-sectional plane of the object,

e. means for rotating said generating means, focusing means, guide plate and scanning means around the object,

f. means for detecting and measuring the intensity of the X-rays passed through the object,

g. a memory for memorizing the output of said detecting means along with the corresponding output signals from the scanning means and the rotating means,

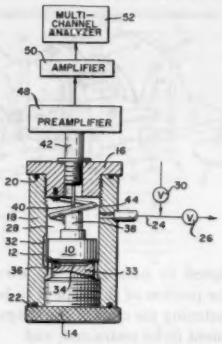
h. means for calculating the absorption value at each micro matrix area on said cross-sectional plane from the data memorized in the memory, and

i. means for displaying said respective calculated absorption values two-dimensionally.

4,045,673
TEST CHAMBER FOR ALPHA SPECTROMETRY

Robert P. Larsen, Downers Grove, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 12, 1976, Ser. No. 685,589
Int. Cl.[2] G01T *1/20, 1/24*
U.S. Cl. 250—364 5 Claims

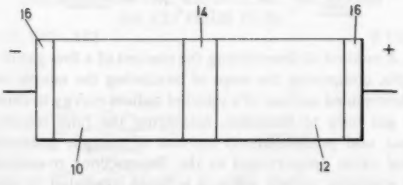


1. A test chamber for alpha spectrometry comprising:
a detector responsive to alpha radiation to generate therefrom an electrical signal;
means for supporting the detector in a fixed reproducible position;
means for disposing an alpha emitter an a metal planchet in reproducible close proximity to the detector;
means for maintaining the alpha emitter and the detector in a vacuum environment; and
means connected to the detector for coupling the electrical signal outside the vacuum environment.

4,045,674
DIAMONDS

Leon Ampeir Vermeulen, 24, Ferreira Street, Discovery, Transvaal, South Africa

Filed Nov. 28, 1975, Ser. No. 636,144
Claims priority, application South Africa, Dec. 4, 1974, 74/7725
Int. Cl.[2] G01T *1/22*
U.S. Cl. 250—370 11 Claims

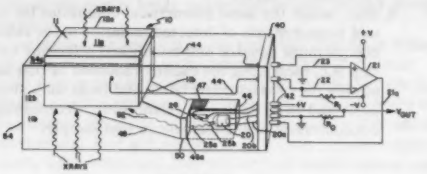


1. A method of causing an electrical current to flow through a body of type II*b* diamond which has been subjected to radiation so as to cause atomic displacements, including the steps of applying an electrical potential across the body and exposing the body to ionizing radiation while maintaining an electrical potential across the body.

4,045,675
SOLID STATE RADIATION DETECTOR SYSTEM

Jack D. Kingsley, Schenectady, and Henry H. Woodbury, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 12, 1976, Ser. No. 704,416
Int. Cl.[2] G01T *1/24*
U.S. Cl. 250—370 10 Claims

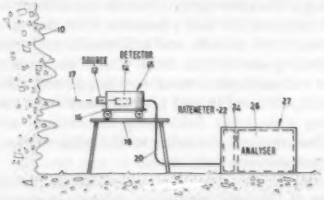


1. A system for detecting the magnitude of a flux of externally produced radiation, comprising:
solid state radiation detector means for varying the magnitude of an electrical parameter responsive to the magnitude of a total incident flux of optical photons and externally produced radiation;
first means for generating a flux of optical photons incident on said detector means;
second means for causing the flux of said first means to vary responsive to changes in said electrical parameter to maintain the magnitude of said electrical parameter substantially constant at said detector means; and
third means for monitoring said optical flux of said first means to generate a system output having a magnitude proportional to the flux of said externally produced radiation.

4,045,676
DETERMINING ELEMENT CONCENTRATIONS IN SAMPLES

Rainer Rolle, Randburg, Transvaal, South Africa, assignor to Ortec Incorporated, Oak Ridge, Tenn.

Filed Mar. 13, 1975, Ser. No. 558,190
Claims priority, application South Africa, Mar. 15, 1974, 74/1707
Int. Cl.[2] G01N *23/20*
U.S. Cl. 250—272 26 Claims



1. A method of determining the concentration of an element in a sample which has a rough surface comprising the steps of:
A. irradiating at least one calibration sample of known concentration of the element to excite rdiation from the element in a known energy band characteristic of the element and
i. measuring such radiation to establish a relationship between the measured characteristic radiation and the concentration of the element, and
ii. measuring under substantially the same geometrical conditions of irradiation and detection as in step A.i., the rate of emission of detected radiation in a reference energy range, said reference energy range being relatively wide compared to said characteristic band such that the ratio of the characteristic radiation to reference

range radiation is small, such rate establishing a reference value for that range; and

B. irradiating the rough surfaced sample to be analyzed,

i. first measuring the rate of emission of detected radiation from that sample in said reference energy range, while varying the geometrical conditions of irradiation and detection until the measured rate of detected radiation in the reference energy range is equal to the established reference value, and

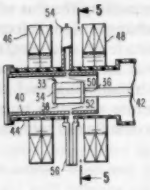
ii. then, under the same geometrical conditions for which said measured rate of detected radiation in the reference energy range equaled said established reference value in step B.i., measuring the excited radiation of that sample in only the characteristic band, and from such measurement and the established relationship, determining the concentration of the element in that sample.

4,045,677

INTENSE ION BEAM GENERATOR

Stanley Humphries, Jr., and Ravindra N. Sudan, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed June 11, 1976, Ser. No. 695,219
Int. Cl.[2] H01J *27/00*
U.S. Cl. 250—423 R **15 Claims**



1. The method of generating intense ion fluxes comprising:

providing an anode surface and a closely spaced cathode surface in a vacuum chamber, said anode surface being substantially transparent to electrons and including a material capable of forming a plasma;

maintaining said cathode surface at a ground reference potential;

applying a pulse voltage in the megavolt range to said anode to produce a plasma at the surface of said anode, said pulse having a duration approximately equal to or less than the time required for said plasma to form and to fill the gap between said cathode and said anode, said pulsed voltage producing an electric field which accelerates electrons from said cathode toward said anode and which accelerates ions formed in said plasma away from said anode;

applying a magnetic field along the cathode-anode axis to confine emitted electrons to the area of the cathode to prevent current loss; and

collecting the ions drawn out of said anode plasma, a voltage pulse of 130 nsec producing currents in excess of 5 kA.

4,045,678

MEDICAL RESTRAINT

Michael E. Rickard, 1324 Buena Vista, Pacific Grove, Calif. 93950

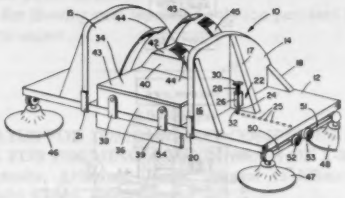
Continuation-in-part of Ser. No. 553,396, Feb. 27, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,772
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—451 **16 Claims**

10. A restraint for holding a portion of a patient such as the head or a limb in a fixed position on an X-ray table for the taking of X-rays, said restraint comprising:

a platform having at least one laterally spaced pair of slot formed therein;

means for mounting the platform to the X-ray table including a plurality of elongate support elements, each of the support members having one end pivotally attached to the platform, the opposite end of each of the support elements having a suction cup pivotally attached thereto;

a padded surface overlying the platform intermediate the slots and attached to the platform, said padded surface adapted to receive and support the portion of the patient to be restrained thereupon;



a strap adapted to pass upwardly through the slots and around the portion of the patient to be restrained;

means for fastening the ends of the straps around the portion of the patient to be restrained; and

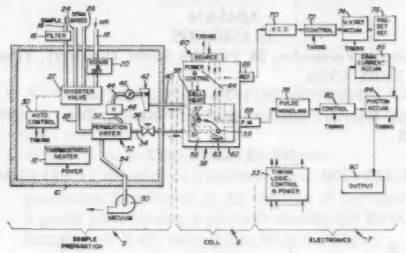
a pair of sidewalls attached to the platform on opposite sides of the padded surface, at least one of said sidewalls being movable with respect to the padded surface so that the portion of the patient to be restrained can be secured between said sidewalls.

4,045,679

FLUORESCENT GAS ANALYZER

Court Lone Wolfe, Pittsburgh, and Ronald Louis Krutz, N. Huntingdon, both of Pa., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 27, 1976, Ser. No. 690,595
Int. Cl.[2] G01N *21/38*
U.S. Cl. 250—461 R **59 Claims**

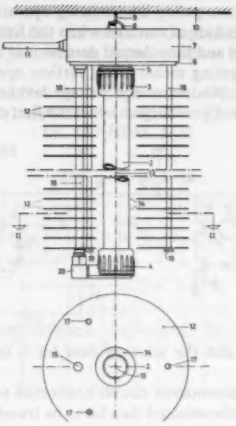


1. A method of determining the content of a first gas in a gas sample, comprising the steps of irradiating the sample with a predetermined amount of a selected radiant energy to cause the first gas only to fluoresce, measuring the time required to output said predetermined amount of energy, generating a digital value proportional to the fluorescence re-emitted by said irradiated sample while it is being irradiated by said selected radiation using digital counting means, generating a digital dark current correction value by counting pulses proportional to the dark current for a length of time substantially equal to said measured period of time while said gas sample is not being irradiated by said selected radiation, and subtracting the value of the dark current correction from the value of the fluorescence.

4,045,680
SHIELDING ARRANGEMENT FOR A ROD SHAPED UV RADIATOR

Alois Loher, Talblick 16, D-8451 Haselmuhl, Germany

Filed June 28, 1976, Ser. No. 700,732
Claims priority, application Germany, July 1, 1975, 2529166
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—504 45 Claims



1. In a shielding arrangement for a rod shaped UV radiator, comprising a plurality of shielding plates which are held parallel to each other at a predetermined spacing by a holding device, the improvement comprising:

a. the shielding plates being aperture disks each of which has a hole of a size at least large enough for leading the UV radiator through it in the direction of its rod axis;

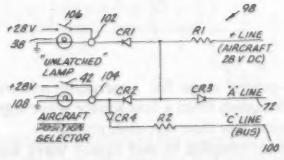
b. the holes of all the individual aperture disks aligned axially with respect to each other; and

c. the aperture disks matched to each other with respect to their hole dimension ($2r$), their outside dimension (**2R**), their thickness (d) and their mutual spacing (a) in such a manner that UV light which emanates from a section of the UV radiator located between two adjacent aperture disks when the UV radiator is placed axially through the aligned holes issues with a small aperture angle (α) essentially only between these two adjacent aperture disks but not between other aperture disks.

4,045,681
CARGO TRANSFER LOGIC CIRCUITRY

Roger Boy de la Tour, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 528,170, Nov. 29, 1974, Pat. No. 3,958,165.
This application Dec. 22, 1975, Ser. No. 643,608
Int. Cl.[2] H01H 19/64
U.S. Cl. 307—113 6 Claims



1. In a cargo transfer shutoff system, vehicle selector and status circuit means comprising:

first diode means including an anode and a cathode;

first resistance means of a predetermined value connecting a positive voltage of predetermined value to said first diode anode;

first lamp means having a very low resistance value when unlit connecting said first diode cathode to ground;

first switch means connecting said first diode cathode to said positive voltage;

second diode means including an anode and a cathode, said first diode anode being connected to said second diode anode;

second lamp means having a very low resistance value when unlit connecting said second diode cathode to ground;

second switch means connecting said second diode cathode to said positive voltage, said first resistance means being of predetermined value to reduce current passing through it so that said first and second lamp means remain respectively unlit when said first and second switch means are open; and

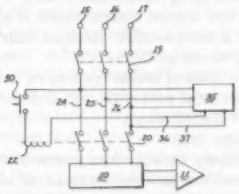
third diode means including an anode and a cathode, said second diode anode being connected to said third diode anode and said third diode cathode being connected to an output lead,

whereby when said second switch means is closed as a selector switch, said output lead is positive to indicate a closed status condition of said first switch means and is zero to indicate an open status condition thereof.

4,045,682
PHASE REVERSAL PROTECTION SYSTEM

Charles R. Poorbaugh, 1183 Kings Lane, and Gerald A. Rhoads, 1335 S. 8th Ave., both of Yuma, Ariz. 85364

Filed May 6, 1976, Ser. No. 683,788
Int. Cl.[2] H02H 3/26
U.S. Cl. 307—127 5 Claims



1. In a three-phase drive motor system including a source of three-phase power wherein said motor is to rotate in only a predetermined rotational direction, means for preventing reverse rotation of said three-phase drive motor as a result of phase reversal of said power source comprising:

a. a three-phase control motor including three phase windings;

b. first, second and third switches each connected in series with a different one of the three phase windings of said three-phase control motor;

c. means connecting said three-phase control motor including said switches to said source of three-phase power to cause rotation of said control motor in a predetermined rotational direction when said drive motor rotates in said predetermined rotational direction;

d. a solenoid-operated switch, including a solenoid winding, connecting said source of three-phase power to the three-phase drive motor to energize said drive motor when said solenoid-operated switch is closed;

e. a fourth switch connected in series with said solenoid winding between two of the three phases of said source of three-phase power;

f. a cam plate having a run position and a stop position;

g. each of said first, second, third and fourth switches including actuating arms having a cam follower portion contacting said cam plate to close said switches when said cam

plate is in said run position and open said switches when said cam plate is in said stop position; and

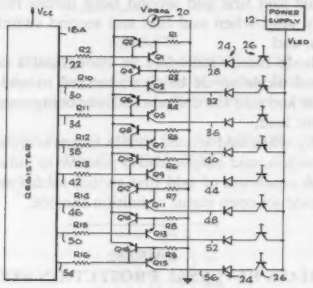
h. means connected to the shaft of said three-phase control motor for moving said cam plate from said run position to said stop position when said three-phase control motor rotates in a reverse direction.

4,045,683

DRIVE CIRCUIT WITH CONSTANT CURRENT

Fred William Erickson, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 28, 1975, Ser. No. 626,251
Int. Cl.[2] H02V *9/02*
U.S. Cl. 307—157 **12 Claims**



1. A constant current drive circuit comprising:

a. first and second source means of electrical potential, said first and second electrical potentials being selectively determinable,

b. current clamping means electrically connected between said first and second source means of electrical potential drawing a determinable constant current, said current clamping means includes

1. bistable control means responsive to said first and second electrical potentials and establishing an electrical current therethrough,
2. a resistor, and
3. a selectively variable third source of electrical potential,
4. said resistor and third source of electrical potential connected in electrical parallel and responsive to said current established by said bistable control means to clamp the electrical level or value of said established current,

c. a controlled device electrically connected between said current clamping means and a selected one of said first and second source means of electrical potential drawing said determinable constant current, and

d. signal generating means selectively enabling and disabling said current clamping means so that the constant current drive circuit is selectively enabled and disabled.

4,045,684

INFORMATION TRANSFER BUS CIRCUIT WITH SIGNAL LOSS COMPENSATION

William Donovan Eads, and David Steven Maitland, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

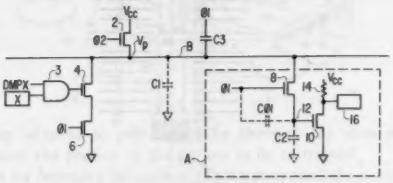
Filed Jan. 19, 1976, Ser. No. 650,344
Int. Cl.[2] H03K *17/16, 17/60, 19/08, 19/20*
U.S. Cl. 307—200 B **3 Claims**

1. An information transfer bus circuit for transferring data bits to a selected destination in response to a predetermined sequence of first and second clocking signals, the bus circuit comprising:

a bus line having an associated first inherent capacitance storing a voltage representing a signal applied to the bus line;

precharge means connected to the bus line and responsive to the second clocking signal, for precharging the bus line to a predetermined voltage level when the second clocking signal is activated;

at least one data gating means connected to the bus line and arranged for receiving the first clocking signal and a selected data bit to be transferred to the selected destination, said data gating means being operative for discharging the precharged bus line when the first clocking signal is activated and the selected data bit is in a first logic state, said data gating means being further operative for maintaining the predetermined voltage level to which the bus line has been precharged when the first clocking signal is



activated and the selected data bit is in a second logic state;

at least one destination circuit connected to the bus line for receiving the selected data bit to be transferred, said destination circuit including a transfer gate connected to the bus line, the transfer gate being arranged for receiving the first clocking signal, the transfer gate including a second inherent capacitance storing the voltage representing the signal applied to the bus line in response to the first clocking signal; and

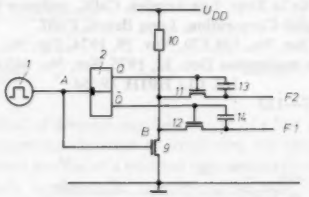
a voltage enhancement capacitor connected to the bus line for coupling the first clocking signal to the bus line, said voltage enhancement capacitor being operative for enhancing the average high and low voltage levels within the destination circuit.

4,045,685

MOS POWER STAGE FOR GENERATING NON-OVERLAPPING TWO-PHASE CLOCK SIGNALS

Wilfried W. Gehrig, Freiburg im Breisgau, Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,917
Claims priority, application Germany, Dec. 17, 1975, 2556735
Int. Cl.[2] H03K *1/18, 5/15, 5/156, 5/04*
U.S. Cl. 307—208 **6 Claims**



1. An MOS-power stage for generating non-overlapping two-phase clock signals from a first square wave signal having a pulse duty factor less than 0.5, comprising:

a power inverter coupled to said square wave signals;

first and second transistors each having a main current path coupled to the output of said power inverter;

first and second capacitors, said first transistor having a gate coupled to its main current path via said first capacitor,

and said second transistor having a gate coupled to its main current path via said second capacitor; and

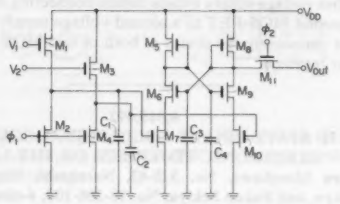
means for coupling the gate terminals of said first and second transistors to one of two inversely related auxiliary square wave signals, each having a pulse duty factor of 0.5 and a frequency equal to substantially half the frequency of said first square wave signal.

4,045,686

VOLTAGE COMPARATOR CIRCUIT

Kenzo Masuda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 24, 1975, Ser. No. 634,773
Claims priority, application Japan, Nov. 25, 1974, 49-134297
Int. Cl.² H03K *5/20*
U.S. Cl. 307—355 **12 Claims**



1. A voltage comparator circuit comprising:

a pair of time constant circuits each of which includes variable impedance means and a capacitor, each of said variable impedance means being controlled by a respective input voltage,

a flip-flop circuit which is stabilized to predetermined values by comparisons of time variations of outputs of said time constant circuits, said flip-flop circuit including first and second inputs, each connected to a respective one of the pair of time constant circuits, and

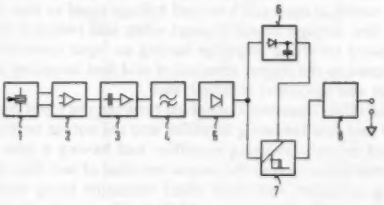
clock control means for enabling said flip-flop circuit to respond to the output of each time constant circuit in synchronism with a clock pulse.

4,045,687

CIRCUIT ARRANGEMENT FOR EVALUATING THE ELECTRICAL OUTPUT SIGNALS OF A DETECTOR FOR THICKNESS CHANGES IN A FUEL INJECTION LINE

Albert Maringer, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 20, 1976, Ser. No. 716,220
Claims priority, application Germany, Sept. 3, 1975, 2539194
Int. Cl.² H03K *5/20*
U.S. Cl. 307—358 **4 Claims**



1. Apparatus for evaluating the electrical output signals of a detector for thickness changes in a fuel injection line due to the influence of the injection process, such as the rapid pressure variations generated when an injection valve is closed, comprising:

a. the series connection of an a-c voltage amplifier responsive to said detected signals at its input, a highpass filter and a rectifier responsive to said a-c voltage output;

b. a peak value storage device having the output of said rectifier as its input;

c. a Schmitt trigger, also having as its input the output of said rectifier, the output of said peak value storage device being connected as a reference input to the Schmitt trigger; and

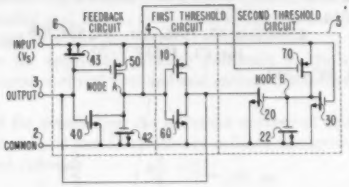
d. a one shot multivibrator connected to the output of said Schmitt trigger.

4,045,688

POWER-ON RESET CIRCUIT

Roger Green Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,253
Int. Cl.² H03K *17/22, 17/20, 21/32*
U.S. Cl. 307—251 **7 Claims**



1. In a switching circuit of the kind comprising a first threshold circuit responsive to an input voltage for producing at its output terminal an output voltage corresponding to that portion of said input voltage of greater than a given magnitude, a second threshold circuit having a threshold higher than the first threshold circuit and responsive also to said input voltage for clamping said output terminal to a point of reference voltage when said input voltage exceeds the threshold of said second threshold circuit and feedback means responsive to signals present on said output terminal for providing a control signal to said first threshold circuit for inactivating said first threshold circuit when said output terminal is clamped to said point of reference voltage, the improvement for inactivating said second threshold circuit subsequent to the inactivation of said first threshold circuit, comprising:

switch means coupled between said output terminal and said point of reference potential and responsive to said control signal for closing when said control signal is present; and

means in said second threshold circuit responsive also to said control signal for disabling said second threshold circuit when said control signal is present.

4,045,689

CIRCUIT FOR SQUARING THE TRANSFER CHARACTERISTICS OF A TTL GATE

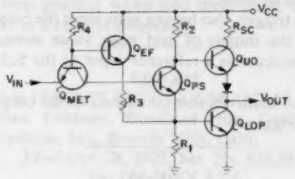
Gary W. Tietz, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed June 1, 1976, Ser. No. 691,934
Int. Cl.² H03K *19/34*
U.S. Cl. 307—254 **7 Claims**

1. In a transistor switching gate having an input stage responsive to an input voltage, which input stage drives a phase splitter, two outputs of which phase splitter drive the bases of two output transistors joined together to derive an output voltage at the junction therebetween, the improvement for obtaining a relatively square transfer voltage characteristic at said output comprising:

an additional transistor connected as an emitter follower with its input coupled to said input stage and its output coupled to said phase splitter for supplying current to said

phase splitter to thereby bias said phase splitter off until said input voltage is high enough to turn on both said



phase plitter and said output stage to thereby result in a substantially square voltage transfer characteristic.

4,045,690

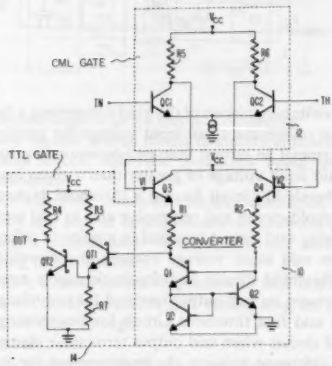
HIGH SPEED DIFFERENTIAL TO TTL CONVERTER

Richard K. W. Tam, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 17, 1976, Ser. No. 658,705

Int. Cl.[2] H03K *5/20*

U.S. Cl. 307—260 **4 Claims**



1. A converter circuit for converting a differential signal of one circuit to a TTL gate compatible signal, said converter circuit comprising:

means for sensing the differential voltage level of said one circuit, said sensing means including first and second transistors each having base, output and common electrodes in which the base of each transistor is coupled to said one circuit for sensing the differential coltage signal developed therein;

means defining a current mirror circuit coupled to said sensing means; and

means coupled between said sensing means and said current mirror means for supplying a compatible signal to said TTL gate to turn said TTL gate on or off depending upon the differential voltage in said one circuit.

4,045,691

LEVEL SHIFT CIRCUIT

Kazuhiro Asano, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

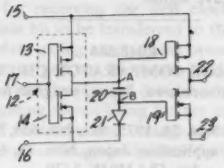
Filed Sept. 21, 1976, Ser. No. 725,266

Claims priority, application Japan, Sept. 22, 1975, 50-114542

Int. Cl.[2] H03K *5/02, 3/353, 17/60*

U.S. Cl. 307—264 **4 Claims**

1. A level shift circuit comprising an inverter, means for supplying a first voltage to said inverter, means for applying an input pulse to said inverter, a condenser, a directional switching element, and first and second MOS-FETs, means connecting an output of said inverter to one terminal of said condenser and to the gate of said first MOS-FET, means connecting a second terminal of said condenser to the gate of said second MOS-FET and through said directional switching element to one terminal of said first voltage supply means, means connect-



ing the source of said first MOS-FET to the other terminal of said first voltage supply means, means connecting the source of said second MOS-FET to a second voltage supply means, and means connecting the drains of both of said MOS-FETs to an output terminal.

4,045,692

SOLID STATE BINARY LOGIC SIGNAL SOURCE FOR ELECTRONIC TIMEPIECE OR THE LIKE

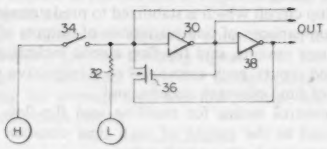
Shigeru Morokawa, No. 325-43, Narahashi, Higashiyamato, Tokyo, and Fukuo Sekiya, No. 28-206-103, 4-chome, Midoricho, Tokorozawa, both of Japan

Filed Sept. 23, 1975, Ser. No. 615,850

Claims priority, application Japan, Sept. 30, 1974, 49-112592

Int. Cl.[2] H03K *3/353, 3/286, 17/04;* **G04C** *3/00*

U.S. Cl. 307—279 **3 Claims**



1. A solid state binary logic signal source for an electronic timepiece comprising:

a first voltage source;

a second voltage source;

an input resistor connected to said first voltage source;

a normally open switch connected to said second voltage source;

a first inverting amplifier having an input terminal connected to

said first and second voltage sources through said input resistor and said normally open switch, respectively, and an output terminal at which a first voltage equal to that of said second voltage source appears when said switch is open and a second voltage equal to that of said first voltage source appears when said switch is closed;

a second inverting amplifier having an input terminal connected to the output terminal of said first inverting amplifier and an output terminal; and

a field effect transistor connected between the input terminal of said first inverting amplifier and the output terminal of said second inverting amplifier and having a gate electrode connected to the output terminal of said first inverting amplifier, said field effect transistor being normally turned on in response tc said first voltage appearing at the output terminal of said first inverting amplifier to provide a low impedance path between the input terminal of said first inverting amplifier and the output terminal of said second inverting amplifier, and said field effect transistor being turned off to provide a high impedance path between the input terminal of said first inverting amplifier

and the output terminal of said second inverting amplifier in response to said second voltage appearing at the output terminal of said first inverting amplifier when said switch is closed.

4,045,693

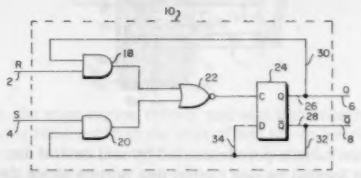
NEGATIVE R-S TRIGGERED LATCH

Gary W. Ester, Redwood City, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 8, 1976, Ser. No. 703,404

Int. Cl.² H03K *3/286*

U.S. Cl. 307—291 **6 Claims**



1. A negative, edge-triggered R-S latch which provides predetermined outputs states for all R and S input conditions, said latch comprising:

an R-input;

an S-input;

a Q-output;

a Q-output;

pulse logic means having an output and having only R, S, Q, an Q-inputs; said pulse logic means logically combining said inputs to provide a binary output depending upon the states of the inputs; and

bistable means having as one input the Q-output and having as a second input the output of said pulse logic means, said bistable means being responsive only to the transitions between a first state and a second state of the binary output of said pulse logic means, said transitions changing the state of the Q and Q-outputs.

4,045,694

CURRENT DIVIDER

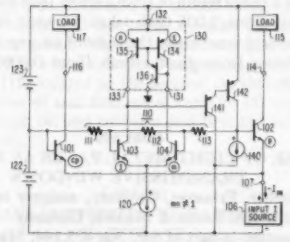
Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1976, Ser. No. 690,654

Claims priority, application United Kingdom, Sept. 26, 1975, 39620/75

Int. Cl.² H03K *1/00*; G05F *3/08*

U.S. Cl. 307—296 R **4 Claims**



1. A current divider comprising:

means for supplying reference, bias and operating potentials;

first and second and third and fourth transistors, all being of the same basic semiconductor material and operated at substantially the same temperature, each having base and emitter electrodes with a base-emitter junction therebetween and having a collector electrode, said first and said second transistors being of the same conductivity types as each other, said third and said fourth transistors being of the same conductivity type as each other;

means connecting said third and said fourth transistors in an unbalanced differential-input, single-ended output amplifier configuration;

means for applying degenerative feedback to said amplifier configurations including:

a potential divider with an input port connected between the base electrodes of said first and said second transistors and with an output port connected between the base electrodes of said third and fourth transistors, including:

means for applying said bias potential to the end of the input port of said potential divider to which the base electrode of said first transistor is connected, and including:

means connecting the single-ended output of said amplifier configuration to the end of the input port of said potential divider to which the base electrode of said second transistor is connected;

a source of input current connected between said reference potential and an interconnection of the emitter electrodes of said first and said second transistors; and

means for applying operating potentials to the collector electrodes of said first and said second transistors, including

a load for conducting the collector current of one of said first and said second transistors as flows in response to said input current.

4,045,695

PIEZOELECTRIC ELECTRO-ACOUSTIC TRANSDUCER

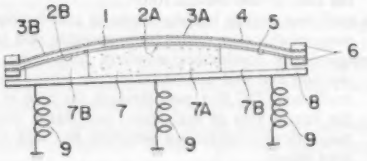
Tadasi Itagaki; Kiyonori Iwama, and Toshikazu Yoshimi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo and Tokorozawa Electronic Corporation, Tokorozawa, both of, Japan

Filed July 14, 1975, Ser. No. 595,631

Claims priority, application Japan, July 15, 1974, 49-81287; May 30, 1975, 50-64932

Int. Cl.² H01L *41/04*

U.S. Cl. 310—322 **2 Claims**

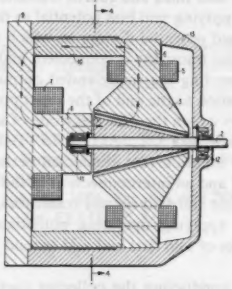


1. A piezoelectric electro-acoustic transducer comprising a flexible film of piezoelectric material; at least one first electrode provided on one side of said flexible film; a plurality of second electrodes provide on the other side of said flexible film and confronting said first electrode through said flexible film, thereby forming a piezoelectric diaphragm having at least two vibration areas thereon; and a support member supporting said piezoelectric diaphragm at the periphery thereof, wherein said support member is locally bent to form a curved portion the curvature of which differs from that of the remaining portion, and said curved and remaining support member portions correspond to respective first and second said vibration areas of said diaphragm, respectively, such that the differently curved support member portions impart different tensions to the vibration area corresponding to said curved portion and another vibration area corresponding to said remaining portion, respectively.

4,045,696
ROTOR STATOR ASSEMBLY FOR A LOW INERTIA STEPPING MOTOR

Heinz Lutz, W.i.S.-Breitenstein; Volker Zimmermann, Schoenaich, and Rainer Zuehlke, Warmbronn, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 9, 1975, Ser. No. 594,428
Claims priority, application Germany, July 13, 1975, 2433809
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—49 R 9 Claims



1. A rotor stator assembly for increasing the torque-to-inertia ratio of a low inertia stepping motor including:

a motor housing;

a solid substantially conical magnetizable rotatably mounted rotor, the surface of which is toothed in the axial direction;

a stator structure including a plurality of inwardly extending poles having AC coils wound thereon and having axially toothed faces axially coextensive with said rotor and spacedly positioned for maintaining a uniform air gap about said rotor;

ring means magnetically connecting said stator poles and forming AC flux paths with said rotor;

nonrotatable core means, having a DC coil wound thereon, axially disposed from said rotor and forming a uniform air gap between the base of said rotor and a face of said core means for magnetizing said rotor;

said face having substantially the same cross sectional area as the base of said conical rotor;

a shaft mounted in bearing means in said housing and said nonrotatable core means for supporting said rotor;

magnetically conductive members connecting said stator stucture and said nonrotatable core means for forming a continuous DC flux path through the base of said rotor, the lateral area of said rotor, said stator structure, said magnetically conductive members and said nonrotatable core means.

4,045,697
PLASTIC CLOSURE CAP FOR ELECTRIC MOTOR

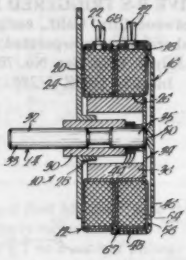
Joseph C. Folik, Hanover Park, Ill., assignor to Molon Motor & Coil Corporation, Rolling Meadows, Ill.

Filed July 29, 1974, Ser. No. 492,543
Int. Cl.[2] H02K *5/00*
U.S. Cl. 310—89 6 Claims

1. In an electric motor including a stator housing forming a stator cavity closed at one end, a bearing mounted in the stator housing, and a rotor having a shaft rotatably mounted in the bearing, the improvement comprising, in combination:

a snap-on resilient plastic closure for the other end of the stator cavity, said closure including a central disc portion closing the stator cavity;

a peripheral rim portion extending from said central disc portion for securing said closure to the motor, said peripheral rim portion carrying a radially-inwardly extending projection for engaging a portion of the motor to secure mechanically the closure thereto, said peripheral rim portion and projection being resilient whereby said closure may be slid over a portion of the stator housing and snapped in place;

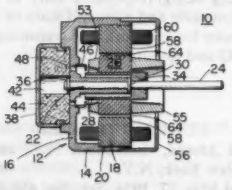


a thrust surface portion carried by said central disc portion and located on said central disc portion along the axis of the motor shaft, said thrust surface portion abutting the end of the motor shaft to locate the shaft axially and to limit end play or travel of the shaft.

4,045,698
SMALL AIR GAP MOTOR

Wayne J. Morrill, 3448 S. Washington Road, Fort Wayne, Ind. 46804

Continuation of Ser. No. 419,619, Nov. 28, 1973, abandoned. This application May 3, 1976, Ser. No. 682,453
Int. Cl.[2] H02K *17/00*
U.S. Cl. 310—166 7 Claims



1. In an electric motor having a stator core member with inwardly extending polar projections having inner ends defining a bore, and a rotor member rotatably mounted in said bore and having a peripheral surface defining radial air gaps with said inner ends, the improvement wherein said air gaps respectively have a radial width of from greater than about 0.001 inch to less than about 0.006 inch taken between said peripheral surface and said inner ends, the ratio of air gap width to rotor diameter being from greater than about 0.0009 to less than about 0.005.

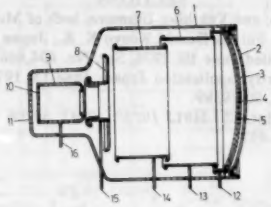
4,045,699
USE OF LIGHT-METAL PANES AS X-RAY TRANSMISSIVE WINDOWS

Stefan Günther, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 475,144, May 31, 1974, abandoned. This application Aug. 26, 1975, Ser. No. 607,874
Claims priority, application Germany, June 19, 1973, 2331210
Int. Cl.[2] H01J *35/00*
U.S. Cl. 313—59 8 Claims

1. In ray-penetrating windows for high-vacuum tubes, the use of X-ray penetrable window panes weldable into heavy-metal frames, said panes being each constituted of a layered

plate formed of two integrally connected layers formed by rolling under high pressure, one said layer being a light-weight metal excluding beryllium having a density of less than 4.5 g/cm³, and the other layer being a heavy-weight metal having a density of more than 4.5 g/cm³, said heavy-weight metal being removed from the center of said light-weight metal layer



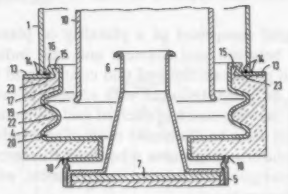
towards the edge region thereof and said light-weight metal layer being removed from the edge of said heavy-weight metal layer so as to form an overlapping two-layered portion, the heavy-weight metal edge providing a vacuum tight connection to said frames, said pane being insertable into said frames and said heavy-weight metal edge portion being weldable thereto.

4,045,700

X-RAY IMAGE INTENSIFIER

Peter Wulff, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 15, 1975, Ser. No. 641,015
Claims priority, application Germany, Dec. 23, 1974, 2461262
Int. Cl.² H01J *1/52*
U.S. Cl. 313—242 **4 Claims**



1. In an x-ray image intensifier having a vacuum-tight metal-ceramic tube including an interposed electrically insulating ceramic component **(4)**, an electrically weakly conductive layer **(17)** covering the surface of said ceramic component **(4)** at least on the side facing interiorly of said tube, the tube having first and second concentric metal cylinders **(1, 10)**, the first metal cylinder **(1)** having an end thereof butt-soldered to the ceramic component **(4)** and the second metal cylinder **(10)** being located inside said first metal cylinder **(1)** and inside of the ceramic component **(4)**, said ceramic component **(4)** being joined to said first metal cylinder **(1)** along a juncture line, and a raised bead **(15)** located on the ceramic component **(4)** along the juncture line of said first metal cylinder **(1)** with said ceramic component **(4)** and between said first and second metal cylinders **(1, 10)**.

4,045,701

SHADOW MASK SUPPORTED BY CATHODE RAY TUBE FACEPLATE

Lawrence W. Dougherty, Sleepy Hollow, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

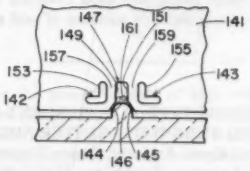
Filed Feb. 2, 1976, Ser. No. 654,130
Int. Cl.² H01J *29/02, 29/07, 31/20*
U.S. Cl. 313—408 **27 Claims**

1. In a color cathode ray tube, the combination comprising:

an approximately rectangular faceplate supporting on a concave inner surface thereof in a central region a phosphor screen comprising a pattern of red-emissive, blue-emissive and green-emissive phosphor element triads;

a lightweight, approximately rectangular shadow mask having a central portion which has a curvature related to the curvature of said faceplate inner surface and which contains a pattern of electron-transmissive apertures registerable with said pattern of phosphor triads, said mask having means providing substantial rigidity with respect to axes normal to the sides thereof, but providing for flexure of the mask with respect to its diagonals; and

a mask suspension system for establishing a predetermined spatial position of said mask relative to said inner surface of said faceplate, comprising four suspension means for mechanically coupling said mask to said faceplate, said suspension means being located one at each corner of the mask to permit the mask to flex about said diagonals and conform to the contour of the faceplate, all four of said suspension means having means effecting a predetermined spacing of the mask from said inner surface of said faceplate, three of said four suspension means also effecting an angularly rigid and precise coupling of said mask to said faceplate, said combination being characterized by:



each of said three suspension means comprising an integral modification of said faceplate inner surface which defines two angularly spaced, axially convergent engagement surface areas,

said mask having in each of three corner portions associated with said three suspension means, corner-located means for making angularly retentive, two-point engagement with said two angularly spaced engagement surface areas on one of said modifications of said faceplate, the resultant six-point engagement of said three corner-located means with said three integral modifications of said faceplate effecting said angularly rigid and precise coupling of said mask to said faceplate,

said combination including means for immovably holding on said faceplate said three corner-located means and a corner-located means on a fourth corner portion of the mask when said tube is assembled — including during thermal expansion and contraction of the mask, and

said mask corner portions each having means for providing high radial compliance therein such that upon thermal expansion of said mask, any radial loads imposed on the mask corners are purely radial and of insufficient magnitude to significantly deform the mask.

4,045,702

FLUORESCENT CHARACTER INDICATING TUBE

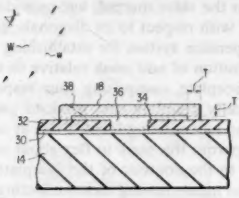
Osamu Yasutome, Taishi, and Mitsuo Takeda, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed June 18, 1976, Ser. No. 697,461
Claims priority, application Japan, June 18, 1975, 50-73876
Int. Cl.² H01J *1/72, 63/06*
U.S. Cl. 313—496 **4 Claims**

1. In a fluorescent character-indicating tube comprising an evacuated envelope including at least a partially transparent viewing window, an insulating base plate, a plurality of lead circuits printed on said base plate, a thin insulating layer having a plurality of pin holes printed on said lead circuits, a plurality of co-planar anode elements arranged on said insulating thin

layer in a predetermined form, and at least one elongated filament positioned above said anode elements for generating electrons, improved anode elements, each comprising:

an anode electrode segment printed on said thin insulating layer so as to be located on at least one of said pin holes in said thin insulating layer for electrically connecting said anode electrode segment to said lead circuit,



each said anode electrode segment having exposed top and side surfaces projecting from said thin insulating layer toward said filament; and,

a phosphor layer being deposited over the entire extent of the exposed top and side surfaces of said anode electrode segment.

4,045,703

FLAT ENVELOPE TYPE FLUORESCENT CHARACTER INDICATING TUBE WITH GETTER SHIELD PLATE

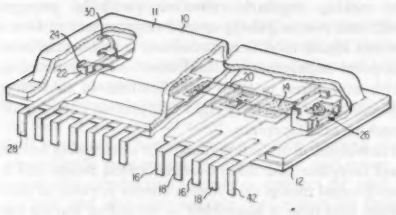
Yasamasu Mori; Kenzo Ashiuchi; Osamu Yasytome, all of Hyogoken, and Tagayasu Sawamura, Himejishi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 664,395, March 5, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 750,153

Claims priority, application Japan, Mar. 6, 1975, 50-26489

Int. Cl.[2] H01J *19/12, 19/70, 63/02*

U.S. Cl. 313—497 **7 Claims**



1. A flat envelope type fluorescent character indicating tube comprising:

a base plate;

an envelope cover having a transparent conductive film at least partially on its inner surface, said envelope cover being sealed with said base plate for constructing an evacuated envelope;

a plurality of digit indicating elements being arranged lengthwise on said base plate, each of said elements having a plurality of anode segments shaped to indicate predetermined indicia and a control grid for selecting the indicating digit location;

a getter source container;

a getter support structure located adjacent one end portion of said base plate and positioned thereon for supporting said getter source container and having a shield plate, said shield plate extending toward said inner surface of said envelope cover to minimize distribution of getter film toward the location of said digit element; and

at least one elongate filament being extended above said digit indicating elements, one end of said filament being secured to said getter support structure at a location beyond said shield plate.

4,045,704

MULTI-DIGIT FLUORESCENT DISPLAY TUBE WITH DIFFERENTLY SPACED PLANAR CONTROL GRID SECTIONS

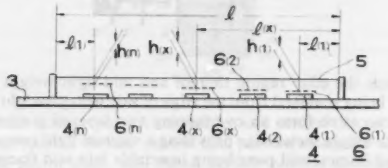
Takao Kishino, and Yukihiko Utamura, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K. K., Japan

Filed June 10, 1976, Ser. No. 694,666

Claims priority, application Japan, June 13, 1975, 50-79388; June 13, 1975, 50-79389

Int. Cl.[2] H01J *19/38, 19/42, 63/06*

U.S. Cl. 313—497 **9 Claims**



1. A multi-digit fluorescent display tube comprising:

a substrate;

a plurality of multi-digit indicating patterns arranged in a row in spaced side-by-side relationship along the longitudinal width of said substrates, each of said indicating patterns comprising a plurality of segmented anodes on which phosphor layers are deposited;

at least one electron emitting filament stretched along the longitudinal direction of said indicating patterns so as to be in parallel and opposite to each of said indicating patterns;

a control grid comprised of a plurality of planar sections disposed between said filament and said indicating patterns, said planar sections of said control grid being positioned at different distances with respect to said filament; whereby the perveance of each of said indicating patterns is adjusted so as to illuminate each of said indicating patterns in uniform brightness when said fluorescent display tube is energized by heating said filament with a direct current power source;

a light transparent evacuated sealed envelope in which the anodes, the filament and the control grid are disposed and through which the display may be viewed externally when the display tube is in operation.

4,045,705

ELECTRON BOMBARDED SEMICONDUCTOR DEVICE

David H. Smith, San Jose, and Richard I. Knight, Los Altos, both of Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.

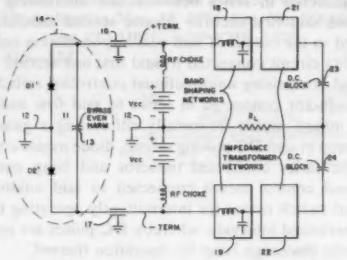
Filed June 17, 1976, Ser. No. 697,224

Int. Cl.[2] H01J *31/04*

U.S. Cl. 315—3 **4 Claims**

1. An electron bombarded semiconductor device having an evacuated envelope, an electron gun positioned at one end of said envelope to project an electron beam along said envelope in a predetermined path, and means responsive to an input signal for deflecting said beam from said path, the invention comprising: a target within said envelope comprising a pair of spaced semiconductor diode devices each having first and second regions of opposite conductivity types forming a p-n junction with a region adapted to receive said beam, said beam impinging between said devices when it is in said predetermined path and impinging a region of one or the other of said devices when deflected responsive to said input signal, said target including a common ground and means for connecting one region of each of said devices, but of opposite conductivity

type, to said common ground; a load having one terminal connected to said common ground and the other ac coupled to the other regions of said semiconductor diode devices and



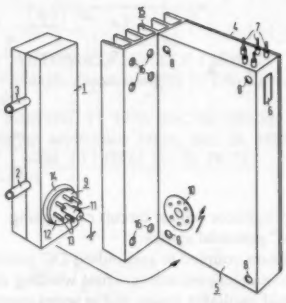
means for applying a unidirectional voltage between said common ground and said other regions to reverse bias said diode devices.

4,045,706

ARRANGEMENT HAVING A TRAVELING-WAVE TUBE AND A CURRENT SUPPLY UNIT

Erich Daffner, Ottobrunn, and Herbert Sarnezki, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 13, 1976, Ser. No. 686,138
Claims priority, application Germany, May 28, 1975, 2523689
Int. Cl.[2] H01J *25/34*
U.S. Cl. 315—3.5 **10 Claims**



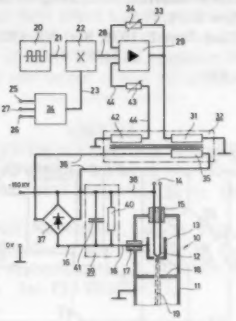
1. An arrangement for modular directional radio systems comprising a traveling-wave tube mounted in a substantially parallelepiped tube housing with four longitudinal sides and two end sides having an HF plug outlet communicating with said tube and mounted in one of the sides of said housing, and a power unit mounted in a separate substantially parallelepiped power supply housing having a reciprocal plug socket mounted in said power supply housing communicating with said traveling-wave tube by means of said plug outlet, wherein all electrical connecting supply lines in said traveling-wave tube are connected to said plug outlet mounted in said tube housing and said plug outlet is enclosed by a sleeve means comprising an electrically conductive compressible material; all electrical connecting supply lines in said power supply unit directed to said traveling-wave tube are connected to said reciprocal plug socket; and, said sleeve means forming an electrically conductive high frequency seal around said outlet when the tube and power supply housings are interfaced, said sleeve means being compressed between said housings.

4,045,707

SYSTEM FOR THE POWER CONTROL OF HIGH VOLTAGE ELECTRON BEAM GENERATORS

Thorn Gernot, Hanau am Main, and Thomas Friedric-Wilhelm, Niedermittlau, both of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed Mar. 29, 1976, Ser. No. 671,631
Claims priority, application Germany, Apr. 4, 1975, 2514805
Int. Cl.[2] H05B *7/02;* **H01J** *37/30;* **B23K** *15/00*
U.S. Cl. 315—106 **2 Claims**



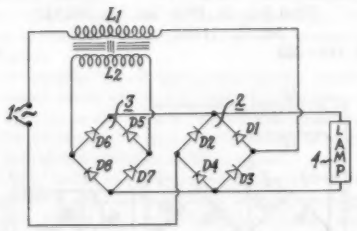
1. System for the power control of high voltage electron beam generators comprising a directly heated cathode and a control electrode associated with the cathode, said system having high voltage isolation transformer means with primary and secondary winding for supplying the control electrode with a control voltage, means preceding the isolation transformer means on the primary side for the generation of square wave pulses symmetrical with the null line, means responsive to the comparison of the actual beam current and a reference value for amplitude modulating the square wave pulses, said isolation transformer means being provided with a tertiary winding on the primary side, said primary winding receiving input from the output of amplifier means having one input connected with the output voltage of the tertiary winding and another input receptive of the modulated square wave pulses and rectifier bridge means connected across the secondary winding.

4,045,708

DISCHARGE LAMP BALLAST CIRCUIT

Wayne R. Neal, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,531
Int. Cl.[2] H05B *41/16;* **H02M** *5/06, 5/20*
U.S. Cl. 315—171 **11 Claims**



1. Electrical operating circuit comprising, in combination, a source of alternating current, current limiting reactance means comprising a first induction coil connected to said source of alternating current for applying alternating current to said first induction coil, an auxiliary induction coil inductively coupled

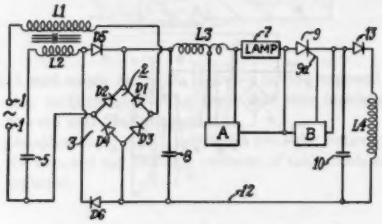
to said first induction coil, first full wave rectifier means connected to the output of said first induction coil, said first induction coil being connected in series between said source of alternating current and said first rectifier means, second full wave rectifier means connected to the output of said auxiliary induction coil, and load means connected to the combined outputs of said first and second rectifier means.

4,045,709

DISCHARGE LAMP OPERATING CIRCUIT

Don Morais, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed June 2, 1976, Ser. No. 692,078
Int. Cl.[2] H05B *41/30*
U.S. Cl. 315—205 **11 Claims**



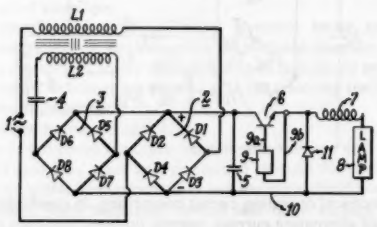
1. A lamp operating circuit comprising, in combination, DC supply means comprising input terminals for connection to an AC current source, current limiting reactance means comprising a first induction coil connected to said input terminals, an auxiliary induction coil inductively coupled to said first induction coil, first rectifier means connected to the output of said first induction coil, and second rectifier means connected to the output of said auxiliary induction coil, and a DC pulsing circuit connected to said first and second rectifier means and comprising a first inductor, unidirectional controlled switch means, and a capacitor connected in series with each other across said DC supply means, means for serially connecting a gaseous discharge lamp in said DC pulsing circuit, a second inductor of higher inductance than said first inductor connected across said capacitor and forming a discharge loop therewith, and control means connected to said unidirectional controlled switch means for intermittently operating the same at predetermined intervals, whereby DC pulses are applied to the gaseous discharge lamp for operation thereof and operation of the lamp during the starting interval is stabilized.

4,045,710

DISCHARGE LAMP OPERATING CIRCUIT

Wayne R. Neal, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed July 26, 1976, Ser. No. 708,520
Int. Cl.[2] H05B *41/16, 41/36*
U.S. Cl. 315—205 **7 Claims**



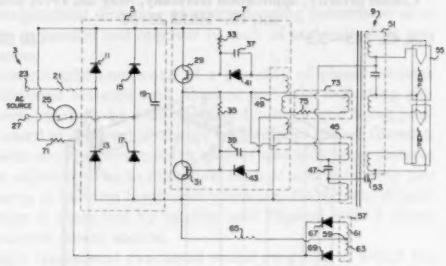
1. A lamp operating circuit comprising, in combination, a source of alternating current, current limiting reactance means comprising a first induction coil connected to said alternating current source, and auxiliary induction coil inductively coupled to said first induction coil, first rectifier means connected to the output of said first induction coil, said first induction coil being connected in series between said alternating current source and said first rectifier means, second rectifier means connected to the output of said auxiliary induction coil, and a DC pulsing circuit connected to said first and second rectifier means and comprising unidirectional controlled switch means and an inductor connected in series to said first and second rectifier means, means for serially connecting a gaseous discharge lamp in said DC pulsing circuit, diode means connected across the series connected inductor and lamp connecting means, and control means connected to said unidirectional controlled switch means for intermittently operating the same at predetermined intervals, whereby DC pulses are applied to the gaseous discharge lamp for operation thereof.

4,045,711

TUNED OSCILLATOR BALLAST CIRCUIT

Ira Jay Pitel, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 19, 1976, Ser. No. 668,485
Int. Cl.[2] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **13 Claims**



1. A tuned oscillator ballast circuit comprising:

a pulsed DC potential source;

oscillator means coupled to said pulsed DC potential source;

first inductive means including a first winding directly coupled to said oscillator means and in series connection with a charge storage means to form a series resonant circuit shunting said oscillator means;

second inductive means including a second winding directly connected to said oscillator means to provide drive signals therefor;

third inductive means including a third winding in shunt connection across said charge storage means of said series resonant circuit and coupled to lamp circuitry to form a load circuit;

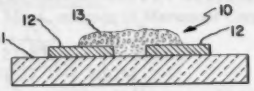
fourth inductive means including a fourth winding inductively coupled to said first inductive means and directly connected by a pair of diodes to said pulsed DC potential source to effect clamping thereof at a given potential level whereby said given potential level is maintained despite open circuiting of said load circuit and increased current flow through said charge storage means; and

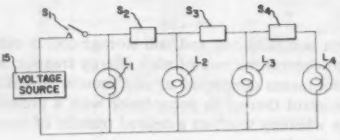
power factor correcting circuit means in the form of a capacitor shunting and an inductor coupling said pulsed DC potential source to an AC potential source.

4,045,712
VOLTAGE RESPONSIVE SWITCHES AND METHODS OF MAKING

Arthur N. DeTommasi, Newtonville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 554,724, March 3, 1975, Pat. No. 3,976,811.
This application Mar. 15, 1976, Ser. No. 666,606
Int. Cl.[2] H01C 7/10; F21K 5/02
U.S. Cl. 315—323 6 Claims



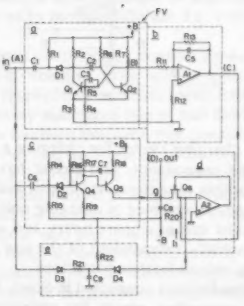


1. An irreversible voltage sensitive switch characterized by a first high resistance state of greater than approximately a megohm and a second low resistance state of less than approximately a hundred ohms, said switch comprising:
a pair of spaced electrodes on a support member; and
a mixture of a substantially pure grade copper powder having an oxidized outer surface and an organic binder overlying a portion of said spaced electrodes, the space therebetween and said support member, said mixture including approximately one part binder to two to five parts oxidized copper powder.

4,045,713
AUTOMATIC SWEEP CIRCUIT

Tadaaki Goto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,329
Claims priority, application Japan, Jan. 20, 1975, 50-8463
Int. Cl.[2] H01J 29/70, 29/72
U.S. Cl. 315—391 2 Claims

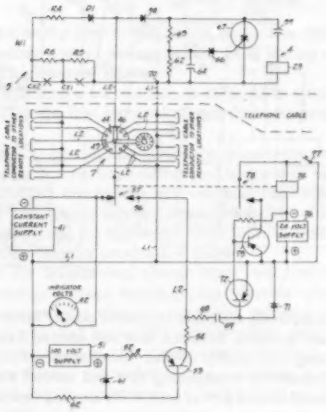


1. An automatic sweep circuit comprising:
frequency voltage converter circuit means connected to a source to receive therefrom an input signal, to generate input pulses, and to convert said pulses to a d.c. voltage proportional to the frequency of said input signal;
saw tooth wave generator means connected to said source for generating saw tooth waves when triggered by said input signal; and
variable resistance circuit means, connected to said frequency voltage converter means and to said saw tooth wave generator means, for controlling said saw tooth wave generator means by controlling the period of said saw tooth waves such that said saw tooth waves automatically follow said frequency of said input signal, said variable resistance circuit means comprising an operational amplifier having an input connected to said frequency voltage converter circuit means to receive therefrom said d.c. voltage and an output, and a field effect transistor serially connected between the output of said saw tooth wave generator means and said input of said operational amplifier, said field effect transistor having a gate connected to said output of said operational amplifier, the gate voltage of said field effect transistor thereby being controlled by said output of said operational amplifier.

4,045,714
REMOTE SWITCH CONTROL AND STATUS INDICATOR SYSTEM

Donald A. MacLeod, 6815 Ridgewood Drive, Oakland, Calif. 94611

Continuation of Ser. No. 493,343, July 31, 1974, abandoned, which is a continuation of Ser. No. 294,822, Oct. 7, 1972, abandoned. This application Apr. 8, 1975, Ser. No. 584,569
Int. Cl.[2] H01H 47/32
U.S. Cl. 361—156 9 Claims



1. In a remote switch control and status indicator system for conductor lines for power distribution circuits,
a plurality of detector circuits,
a plurality of disconnect circuits,
an indicator circuit,
a power supply circuit for the disconnect circuits, selector means to connect the indicator circuit to a selected detector circuit,
means to connect at will said power supply circuit to a disconnect circuit selected by said selector means,
a fault detector switch in each detector circuit, means actuated by overcurrent in said conductor circuit to operate said fault detect switch to indicate a fault,
a disconnect switch in each disconnect circuit for breaking the circuit of said conductor lines, said disconnect switch normally closing said circuit of each conductor lines,
disconnect switch operating means related to said disconnect circuit and actuated by said power supply to operate each disconnect switch for alternately breaking and closing the circuit of said conductor lines whenever said power supply is connected to said disconnect circuit,
a status indicator switch in each detector circuit being responsive to the status of said disconnect switch,

a fault detector switch and a disconnect switch being provided at each of spaced stations along said conductor lines whereby through said selector means the fault in said conductor lines can be selectively indicated and whereby the circuit of said conductor lines can be opened or closed selectively by connecting said power circuit to the selected disconnect switch operating means.

said selector means being remote from said stations,

means to connect said circuits to said selector means for selective operation.

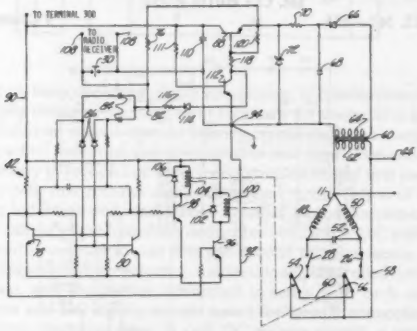
said fault detector switch and said status indicator switch being connected in said detector circuit and through said selector means to said indicator circuit so as to indicate the fault and the status of said switches in the selected detector circuit.

4,045,715

OPERATOR MOTOR CONTROL

Kenneth F. Umpleby, Ann Arbor, and Maurice R. Brackney, Warren, both of Mich., assignors to Multi-Elmac Company, Novi, Mich.

Filed June 16, 1975, Ser. No. 587,399
Int. Cl.[2] H02H *7/85*
U.S. Cl. 318—16 **14 Claims**



1. A selectively operable reversible power drive for closures which are movable between first and second limits of travel comprising; a reversible motive power source, first and second switch means for establishing first and second excitation circuits to said motive power source for causing operation thereof in respectively opposite directions, an electronic bistable circuit device having first and second output stages and responsive to successive applications of an input signal to alternately energize said stages, means operatively interconnecting said first and second stages with said first and second switch means, respectively, thereby to complementally control the conditions of said first and second switch means according to the energization of said stages, a regulated DC voltage source interconnected with said bistable electronic device, and selectively actuable signal generating means connected to the bistable circuit device for applying an input signal thereto with each actuation thereof.

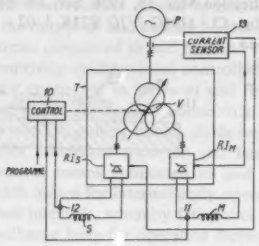
4,045,716

MAGNETIC FIELD SYSTEMS EMPLOYING A SUPERCONDUCTING D.C. FIELD COIL

Trevor Carlisle Bartram, Fossway, Newcastle upon Tyne NE6 2YD, and Paul Alexander Hazell, Ministry of Defence (Navy), D.G. Ships, Foxhill, Bath, Somerset, both of England

Continuation-in-part of Ser. No. 398,359, Sept. 18, 1973, abandoned. This application May 14, 1975, Ser. No. 577,506
Int. Cl.[2] H02P *7/34;* **H02J** *15/00*
U.S. Cl. 318—154 **12 Claims**

1. Equipment for transferring energy to or from a direct-current superconducting field coil to change the magnetic field produced by the coil, said equipment comprising a storage coil which is a direct-current superconducting coil generating a magnetic field when energized, energy transfer means interconnecting said field coil and said storage coil, said energy transfer means being electrically controllable to initiate energy



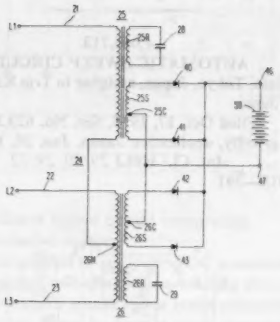
transfer between said field coil and said storage coil in either direction and to control the rate of such energy transfer, and electrical control means connected to said transfer means for the electrical control thereof in accordance with a predetermined program whereby to effect a desired transfer of energy between said coils.

4,045,717

BATTERY CHARGER

William H. Fallon, Parma, and William R. Schober, Avon Lake, both of Ohio, assignors to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 559,159, March 17, 1975, abandoned. This application Apr. 13, 1976, Ser. No. 676,475
Int. Cl.[2] H02J *7/02;* **G05F** *1/12*
U.S. Cl. 320—2 **2 Claims**



1. A battery charging circuit for charging a battery having an effective load capacitance, said circuit having a charging characteristic within predetermined limits, said characteristic being a functional dependence of charging voltage on amperes per predetermined unit of ampere hours, and said characteristic being substantially independent of the size of said battery, which charging circuit further comprises:

a. a pair of transformers connected in Scott-T configuration;

b. an input connecting means for connecting said transformer to a three phase line;

c. an output connecting means for connection to a first terminal of said battery comprising a separate secondary output winding and rectifier circuit, for each of said transformers;

d. a ferroresonant output circuit means associated with each of said transformers for normally maintaining said transformers in saturation, and for cooperating with said output connecting means to provide said charging characteristic,

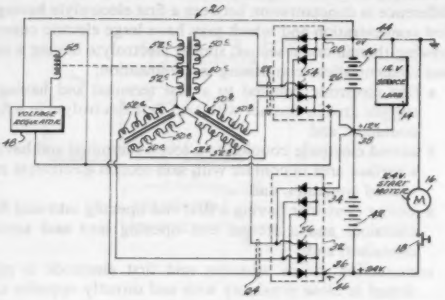
said means comprising a further transformer secondary winding with only a capacitance connected thereacross, said capacitance predetermined in combination with said effective load capacitance to maintain said charging characteristic within said predetermined limits.

4,045,718

MULTIPLE WINDING MULTIPLE VOLTAGE ALTERNATOR ELECTRICAL SUPPLY SYSTEM

Alden J. Gray, Ashfield, Mass., assignor to Maremont Corporation, Saco, Maine

Filed Apr. 2, 1975, Ser. No. 564,638
Int. Cl.[2] H02J 7/14; H02M 7/00
U.S. Cl. 320—17 **14 Claims**



4. A multiple voltage electrical supply system for use with a plurality of load circuits having differing d.c. input voltage requirements, said system comprising:

an alternator having a plurality of sets of generating windings producing a corresponding plurality of a.c. output voltages,

at least one of said sets of generating windings being formed of differently sized conductors than another of said sets of generating windings,

a plurality of rectifiers, each continuously connected with a respective one of said sets of generating windings, for rectifying said plurality of a.c. output voltages into a corresponding plurality of d.c. voltages,

a plurality of batteries continuously connected in series with one another, each of said batteries having two terminals,

a plurality of load circuits continuously connected across different pairs of said terminals of said series connected batteries so as to receive different d.c. voltages from said batteries,

conductor means continuously connecting each of said plurality of d.c. voltages from said plurality of rectifiers across two respectively associated terminals of an individual respectively associated one of said batteries,

said alternator having a magnetic flux conducting ferromagnetic core carrying said sets of generating windings and also having a field coil, the degree of excitation of which controls the total amount of magnetic flux passing through said core and the amplitude of the a.c. voltages induced in the windings of said sets of windings,

said windings being mounted on said core in such a manner that a substantially constant ratio of magnetic flux magnetically links each of the sets of windings when compared to one another, and

a single voltage regulator means responsive to the electrical output from a corresponding single one of said sets of generating windings for controlling the excitation of said field coil and maintaining the electrical output voltages from all of said sets of generating windings at substantially constant values without changing any electrical interconnections between said winding, rectifiers, batteries or load circuits

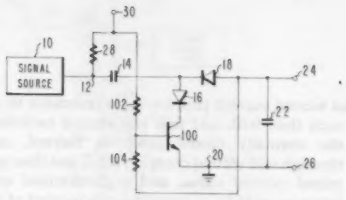
the relative construction, size and disposition of said sets of generating windings being effective to automatically maintain substantially constant output voltages from all sets of generating windings in response to regulation from said single voltage regulator means while, at the same time, automatically varying the charging current produced from said sets of generating windings as required by the respectively corresponding connected batteries.

4,045,719

REGULATED VOLTAGE SOURCE

William Ellsworth Salzer, Margate, Fla., assignor to RCA Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,985
Int. Cl.[2] H02M 7/217; G05F 1/56
U.S. Cl. 363—89 **12 Claims**



12. In an a-c to d-c conversion circuit of the type including first and second charge storage means, each having respective first and second terminals;

means for applying a a-c voltage, as referred to a reference potential, to the first terminal of said first charge storage means,

unidirectionally conductive means for selectively completing a connection between the second terminal of said first charge storage means and said reference potential such that said first charge storage means is supplied charge by excursions of said a-c signal in a sense to be conducted by said unidirectionally conduction means;

and means for transferring charge from said first to said second charge storage means during intervals when said first charge storage means is not being supplied charge, thereby developing an output voltage across said second charge storage means, the improvement wherein:

said unidirectionally conductive means include a voltage controlled switch responsive to control signal applied thereto, and

wherein said voltage source further includes feedback means, responsive to said output voltage for generating said control signal.

4,045,720

AUTOMATIC RESETTING TEMPERATURE CONTROLLED BATTERY CHANGING SYSTEM

Richard Bernard Alexandres, P.O. Box 1645, Mason City, Iowa 50401

Filed May 4, 1976, Ser. No. 683,162
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—35 **8 Claims**

1. A battery charging circuit comprising:

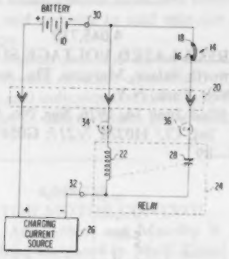
first and second terminals for connecting the charging circuit to a source of direct charging current and to one electrode of like polarity of a battery to be charged; and,

first and second current paths connected in parallel between said first and second terminals for selectively conducting current from said source of charging current to said one electrode of the battery,

said first current path including first and second switching means each having a normally closed position and an open position, said first switching means being actuated from the closed to the open position thereof in response to a

temperature of the battery being charged exceeding a predetermined value,

said second current path including means for actuating said second switching means from the closed to the open position thereof in response to current flow in said second current path exceeding a predetermined current value,



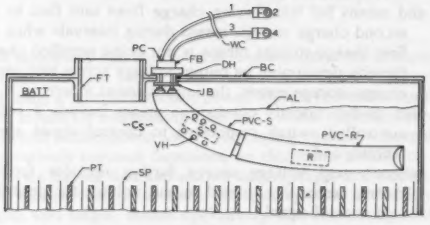
said second current path having a resistance to current flow such that, with said first and second switching means in the normally closed positions thereof, current flow through said second current path is less than said predetermined current value, said predetermined current value being exceeded in response to the opening of either of said switching means.

4,045,721

ELECTRO-CHEMICAL CONCENTRATION TRANSDUCER AND ITS USE TO MEASURE AND CONTROL ACID STRENGTH AND STORAGE BATTERY CHARGE

William H. Swain, 4662 Gleason Ave., Sarasota County, Fla. 33581

Filed Dec. 30, 1974, Ser. No. 537,704
Int. Cl.[2] H02J *7/00;* **G01N** *27/26*
U.S. Cl. 320—43 **15 Claims**



1. A transducer for sensing electrolyte concentration and producing an electric signal potential output proportional to a difference in concentration between a first electrolyte having a first concentration and a second similar electrolyte having a second concentration, comprising in combination;

a first electrode coupled to a first terminal and having a surface area in contact with said first electrolyte contained in a first container, and

a second electrode coupled to a second terminal and having a surface area in contact with said second electrolyte contained in a second container, and

an open joining container having a first end opening into said first container and a second end opening into said second container, and

adapted by construction means to be filled with an electrolyte to form a joining electrolyte making electrolytic connection with said first electrolyte at said first end and also making electrolytic connection with said second electrolyte at said second end to thereby establish a

direct electrolytic connection between said first and said second electrolytes so as to permit a measuring current considerably in excess of that conventionally associated with glass membrane half cell usage to flow through said joining electrolyte to said first and second electrolytes and said first and second electrodes to said first and second terminals,

said open joining container also constructed in elongated form wherein the ratio of the length to the square root of the effective cross-section area is greater than 10 so as to generally prevent mixing by unintentional passage therethrough of said first and said second electrolytes so that neither said first nor said second concentration is altered by more than an allowable amount during the useful life of said transducer.

9. A transducer for sensing electrolyte concentration and producing an electric signal potential output proportional to a difference in concentration between a first electrolyte having a first concentration and which may have large electric current flowing therein and a second similar electrolyte having a second concentration, comprising in combination;

a first electrode coupled to a first terminal and having a surface area in contact with said first electrolyte in a first container, and

a second electrode coupled to a second terminal and having a surface area in contact with said second electrolyte in a second container, and

a joining container having a first end opening into said first container and a second end opening into said second container, and

construction means whereby said first electrode is positioned in close proximity with and directly opposite said first end of said joining container so as to

thereby substantially reduce an extraneous potential across said terminals in the event of said large electric current in said first electrolyte,

said joining container adapted by construction means to be filled with an electrolyte to form a joining electrolyte making contact with and electrolytically connecting said first and second electrolytes so as to permit a

measuring current to flow through said joining electrolyte and said first and second electrolytes to said first and second electrodes and said first and second terminals under the stimulus of said potential,

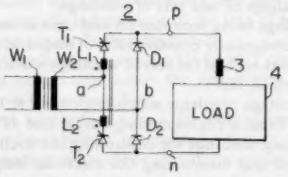
said joining container also having construction means to generally prevent mixing by unintentional passage therethrough of said first and said second electrolytes so that thereby neither said first nor said second concentration is altered by more than an allowable amount during the useful life of said transducer.

4,045,722

POWER CONVERTER SYSTEM

Kyozo Tachibana, Naka, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 19, 1976, Ser. No. 678,175
Claims priority, application Japan, Apr. 28, 1975, 50-51864
Int. Cl.[2] H02M *7/155*
U.S. Cl. 363—126 **18 Claims**



1. A power converter system for converting an alternating current into a desired power, comprising a transformer, a rectifier means including a combination of a plurality of recti-

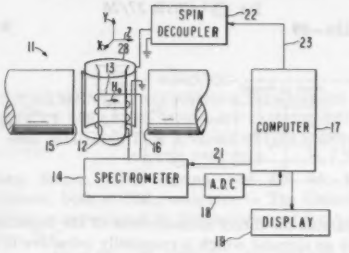
fier elements, said rectifier means being connected through said transformer to said AC power supply, said AC power supply being utilized at the same time as a commutation power source for said rectifier elements, and a plurality of retardation coils connected in series with said rectifier elements at the AC power supply side of said rectifier means, said retardation coils being magnetically coupled with each other.

4,045,723

TWO DIMENSIONAL GYROMAGNETIC RESONANCE SPECTROSCOPY

Richard R. Ernst, Winterthur, Switzerland, assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 15, 1975, Ser. No. 640,364
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—.5 A **13 Claims**



1. In a method of gyromagnetic resonance two-dimensional spectroscopy, the steps of:

inducing a plurality of transient gyromagnetic resonances of a first group of gyromagnetic resonators coupled to a second group of gyromagnetic resonators within a sample of matter to be analyzed;

periodically and during only a portion of said transient gyromagnetic resonances of said first group of gyromagnetic resonators perturbing the interaction of the resonance of said first group of gyromagnetic resonators with the second group of resonators to derive a perturbed period of resonance and a coupled period of resonance during each transient resonance of said first group of resonators;

changing the duration of one of said perturbed and coupled periods of successive ones of said transient resonances of said first group of resonators; and

detecting the induced plurality of said transient gyromagnetic resonances of said first group, as a function of the changing duration of said one of said perturbed and coupled periods of said transient resonances of said first group of resonators to derive gyromagnetic resonance data about said first group of resonators from which to derive simplified gyromagnetic resonance spectral data.

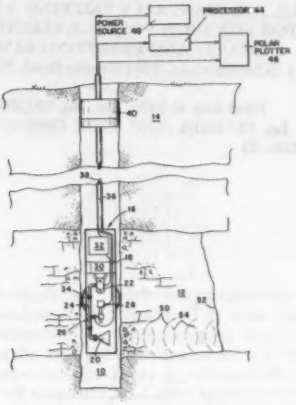
4,045,724

ELECTROMAGNETIC WAVE METHOD FOR MAPPING SUBTERRANEAN EARTH FORMATIONS

Lowell Z. Shuck; George E. Fasching, and Constantine A. Balanis, all of Morgantown, W. Va., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 6, 1976, Ser. No. 674,209
Int. Cl.[2] G01V *3/12, 3/18*
U.S. Cl. 324—6 **2 Claims**

1. A method for mapping anomalies in a subterranean coal bed prior to in situ gasification of the coal bed and for providing the description of the continually changing characteristics and position of a burn front resulting during the in situ gasification of the coal bed, comprising the steps of emplacing a highly directional electromagnetic wave transmitting means and an electromagnetic wave receiving means including a voltage standing wave ratio meter in each of a plurality of vertical directionally oriented bores penetrating the coal bed, transmitting electromagnetic waves at a different selected frequency up to 10,000 MHz over a selected azimuth angle in each of said bores for effecting a reflection of the electromagnetic waves upon encountering an electrical anomaly indicative of at least one of a solid-gas interface indicative of the burn front, a solid-liquid interface, and a solid-solid interface where the



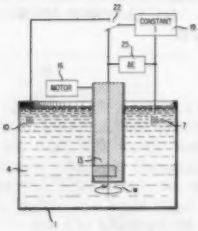
electrical properties of the solids defined in the solid-solid interface differ, and providing a polar plot of the magnitude of the reflected waves and the ratio of the power of the reflected waves to the power of the incident waves at each selected frequency and correlating the dielectric constant of the coal bed and tangent loss at each transmitted frequency with each other for providing the mapping of the anomlies in the coal bed and the description and position of the burn front in the coal bed.

4,045,725

ROTATING ASYMMETRIC ELECTRODE FOR MEASURING CHARACTERISTICS OF ELECTROCHEMICAL CELLS

Barry Miller, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 8, 1976, Ser. No. 665,091
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—30 B **7 Claims**



1. Apparatus for measuring characteristics of a cell containing an electrolyte and having at least a first electrode comprising:

an asymmetrically moving electrode;

means for passing a constant current through said cell and through said first electrode;

means for moving said asymmetrically moving electrode;

means for measuring the voltage between said first electrode and said asymmetrically moving electrode;

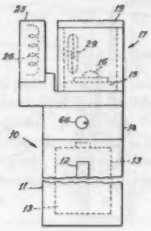
characterized in that said means for moving periodically varies the distance between said first electrode and said asymmetrically moving electrode thereby periodically varying the resistance and voltage between said first electrode and said asymmetrically moving electrode.

4,045,726

TOOL FOR MANUALLY TRIPPING A FAULT INDICATOR FOR HIGH VOLTAGE ELECTRIC POWER CIRCUITS AND RESETTING SAME

Edmund O. Schweitzer, Jr., 1002 Dundee Road, Northbrook, Ill. 60062

Filed July 6, 1976, Ser. No. 702,886
Int. Cl.[2] G01R *31/02, 19/16;* G08B *21/00*
U.S. Cl. 324—51 **5 Claims**



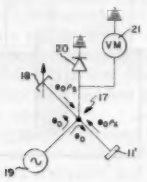
1. A test tool for a fault indicator having a magnetically operable reed switch arranged to be positioned generally parallel to the alternating magnetic field generated around a conductor by flow of alternating fault current therein to operate an indicator to fault indicating position and a circuit responsive to the voltage at which said conductor is energized to reset said indicator to non-fault indicating position including a test point, said test tool comprising a unitary structure including a winding having a longitudinal axis arranged to be placed generally parallel and juxtaposed to the longitudinal axis of said reed switch, a test point contact to engage said test point, means for energizing said winding with alternating current to generate a magnetic field for closing said reed switch to operate said indicator to said fault indicating position, and means for applying a voltage to said test point contact to energize said circuit to reset said indicator.

4,045,727

MICROWAVE PROXIMITY DETECTOR

Se Puan Yu, and Gary H. Glover, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 15, 1976, Ser. No. 667,271
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 B **12 Claims**



1. A non-contacting method of detecting the distance from a reference position to an object comprising the steps of

propagating incident microwave frequency electromagnetic waves through a transmission line to a microwave junction mounted at a reference position to essentially produce propagating reflected waves on one side of the junction and evanescent electromagnetic fields on the other side of the junction,

perturbing the evanescent electromagnetic fields with a resultant variation in a selected parameter of the reflected waves dependent on the linear separation between the reference position and an object in proximity to the microwave junction, and

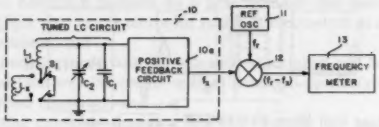
detecting the variation in the selected reflected wave parameter and generating an output indicative of the distance from the reference position to the object.

4,045,728

DIRECT READING INDUCTANCE METER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Richard B. Kolbly, Barstow, Calif.

Filed Apr. 15, 1976, Ser. No. 677,351
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—59 **9 Claims**



1. Apparatus for direct measurement of the inductance exhibited by an element which is essentially inductive in a range below 3μH, comprising

means for generating a first alternating signal at a stable reference frequency, f_r,

means for generating a second alternating signal at an initial frequency, f_o, substantially equal to said reference frequency, said second signal generating means including an LC circuit tuned to resonance at said initial frequency f_o to control the frequency of said second signal, said LC circuit having an inductance at least approximately five times greater than said element,

switching means for connecting said element to be measured to said LC circuit to change the resonant frequency thereof to a frequency f_x,

means for mixing said first and second signals to obtain a third signal of a frequency equal to the difference between the frequencies f_r and f_x, and

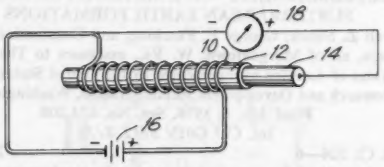
means for measuring the frequency of said third signal and for displaying the value of said element as a linear, function of the frequency of said third signal.

4,045,729

GAS DETECTOR

Jack C. Loh, 16 Beaufort St., White Plains, N.Y. 10607

Filed July 26, 1976, Ser. No. 708,459
Int. Cl.[2] G01N *57/00*
U.S. Cl. 324—71 SN **8 Claims**



1. A gas detector for sensing the presence of a gaseous medium comprising:

a helical coil for connection to a dc power source for generating an electromagnetic field and radiant heat;

a thin-walled tubular sleeve constructed of an active sensing

material having current carriers responsive to an electromagnetic field and disposed in the magnetic and heating fields of said helical coil, said helical coil surrounding said thin-walled tubular sleeve and in contact therewith, said active sensing material being capable of generating a current in response to the current carriers in the presence of a magnetic field at a predetermined temperature; and

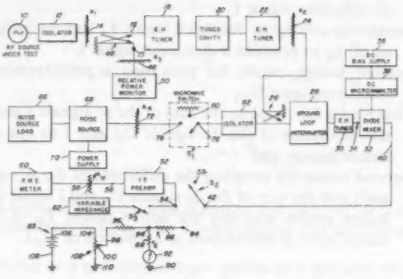
an electrode disposed in said thin-walled sleeve and in surface contact with said sleeve, so when current sensing element is connected between said electrode and one end of said coil, an electromagnetic current will be produced proportional to the concentration of the gas in contact with the outer surface of the sleeve.

4,045,730

INCREMENTAL METHOD AND SYSTEM FOR ABSOLUTE MEASUREMENT OF COHERENT POWER AT MILLIMETER AND SUBMILLIMETER WAVELENGTHS

Abraham Singer, Silver Spring, and Jan M. Minkowski, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 20, 1976, Ser. No. 688,440
Int. Cl.[2] G01R *19/00*
U.S. Cl. 324—76 R **10 Claims**



1. A method for measuring coherent rf power from an rf source having its output connected to a mixer and an i.f. pre-amplifier, the steps comprising:

measuring the noise factor of a system to which the source is connected;

measuring the noise factor of the i.f. pre-amplifier;

measuring the noise temperature ratio of the mixer;

measuring the i.f. conductance of the output of the mixer;

measuring the changes in dc current from the mixer as a result of changes in rf power from the source; and

calculating the absolute coherent rf power in accordance with

$$P_a = 50\,\frac{(\Delta I)^2\,F_T}{g_b(t + F_{IF} - 1)}$$

where

P_a is the rf power at the plane of the mixer;

ΔI is the change in dc current from the mixer;

F_T is system noise factor;

F_{IF} is the i.f. pre-amplifier noise factor;

g_b is i.f. conductance; and

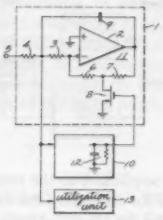
t is the noise temperature ratio of the mixer.

4,045,731

FILTER HAVING AN AUTOMATICALLY CONTROLLED VARIABLE CUT-OFF FREQUENCY

Takashi Tokunou; Shinichi Kouya, and Shigeki Akatsuka, all of Gyoda, Japan, assignors to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Division of Ser. No. 525,807, Nov. 21, 1974, abandoned. This application Jan. 14, 1976, Ser. No. 649,124
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 F **9 Claims**



1. A measuring device for determining the period of an input signal independent of the frequencies of noise signals which may be superimposed on said input signal, comprising means for supplying the input signal whose period is to be measured to a filter apparatus which has an automatically controlled variable cut-off frequency, said filter apparatus comprising a filter circuit which includes a variable element the electrical parameter value of which may be controlled by application of an electrical control signal thereto, the cut-off frequency of said filter circuit being determined by the parameter value of said variable element and said filter circuit exhibiting a frequency cut-off characteristic having a declining portion; a level detector having its input connected to the output of said filter circuit for detecting a filtered output from said filter circuit the level of which varies with variations in the position of the frequency of the signal supplied to said filter circuit relative to the declining portion of the filter circuit cut-off characteristic due to the superimposition of differing frequency noise signals on the signal whose period is to be measured; means connected between the output of said detector and a control input of said variable element for supplying said detected level output as a control signal to said variable element thereby to control the cut-off frequency of said filter circuit in a manner operative to maintain said filtered output level at a given value; and a utilization circuit connected to the output of said filter circuit for receiving a filtered output of said input signal which has a level corresponding to said given value and from which noise signals having higher or lower frequencies than the frequency of the input signal are eliminated, said utilization circuit including means responsive to said filtered output for determining the period of said input signal.

4,045,732

DEVICE FOR SENSING THE OPERATIVE STATUS OF ELECTRICAL EQUIPMENT

Kenji Yashiro, and Yoshifumi Saeki, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

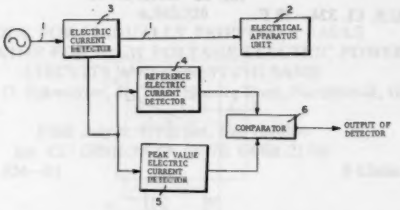
Filed Feb. 4, 1976, Ser. No. 655,157
Claims priority, application Japan, Sept. 2, 1975, 50-106392
Int. Cl.[2] G01R *19/16*
U.S. Cl. 324—133 **8 Claims**

1. A device for sensing the energization condition of an electrical apparatus including an AC-DC converter circuit from at least one power line for the apparatus, comprising:

first amplitude detector means responsive to the current in the power line for generating a mean value signal indicative of the mean value of said current;

second amplitude detector means responsive to the current

in the power line for generating a peak value signal indicative of the peak value of said current, the peak value signal being substantially greater in a first mode when the AC-DC converter is utilized than in a second mode when the converter is not utilized; and



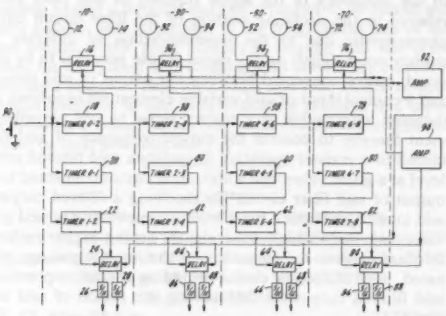
comparator means responsive to the mean value signal and peak value signal for indicating the existence of an energized condition for the electrical apparatus when there is greater than a selected ratio between the peak value and mean value signals.

4,045,733

MULTIPLEX CIRCUIT WITH TIME DELAY FOR STABILIZATION

Jerome J. Dolan, Evergreen Park, and Roy R. Rosenberger, Wheaton, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 6, 1976, Ser. No. 702,845
Int. Cl.[2] G01R *15/12;* **H04Q** *1/20*
U.S. Cl. 324—140 R **3 Claims**



1. A multiplex circuit for use with a plurality of measuring means which require a period of stabilization after activation, said circuit including a plurality of measuring stages, each stage having at least one measuring means, readout means and timing means, said timing means including first, second and third timers, said first and second timers having a common input with the output of said first timer being connected to a measuring means, the output of said second timer being connected to the input of said third timer, with the output of said third timer being connected to a readout means, the elapsed operating time of said first timer being equal to the sum of the operating times for said second and third timers, with said second timer activating said third timer a predetermined interval after turn-on of said first and second timers,

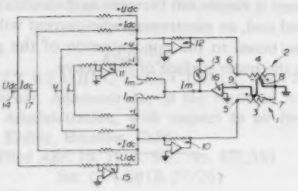
said measuring stages being connected in cascade, with the timing means of one stage being connected to activate the timing means of the successive stage.

4,045,734

DIFFERENTIAL THERMAL WATTMETER

Louis G. Cox, and Norbert L. Kusters, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 24, 1976, Ser. No. 689,643
Int. Cl.[2] G01R *21/02*
U.S. Cl. 324—142 **7 Claims**



1. A thermal wattmeter for determining active power corresponding to ac voltage and current components from proportionally representative ac signals u and i comprising:

two thermal converter means, each of said converter means having heater and sensor means for converting an input signal to a dc output signal;

means for connecting the outputs of the first and second converter means in opposition to provide a dc difference signal;

amplifier means coupled to said connecting means for generating a dc feedback signal I_m;

first source means for providing a predetermined adjustable dc reference signal I_{dc};

means for adding dc feedback signal I_m and the adjustable signal I_{dc} to produce a dc output signal I;

second source means for providing a predetermined dc reference signal U_{dc};

first means for coupling the sum of the ac signals u and i and the difference of the dc signals U_{dc} and I to one of the heater means; and

second means for coupling the difference of the ac signals u and i and the sum of the dc signals U_{dc} and I to the second heater means whereby the active power P_{ac} of the ac components is determined as a function of $U_{dc}I$.

4,045,735

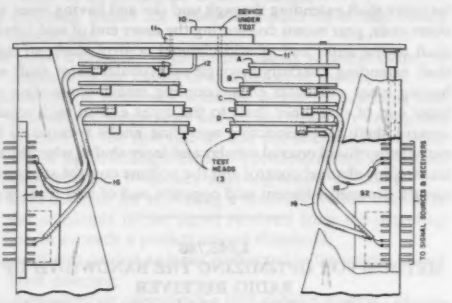
APPARATUS FOR TESTING ELECTRONIC DEVICES HAVING A HIGH DENSITY ARRAY OF PIN LEADS

John L. Worcester, Walnut Creek, and John C. Hubbs, Lafayette, both of Calif., assignors to E-H Research Laboratories, Inc., Oakland, Calif.

Filed Feb. 17, 1976, Ser. No. 658,302
Int. Cl.[2] G01R *31/26, 31/02*
U.S. Cl. 324—158 F **3 Claims**

1. Apparatus for testing electronic devices having a high density array of pin leads comprising: test socket means for receiving said pin leads and having a plurality of output leads each corresponding to one of said pin leads said ouptut leads having an array density corresponding to said pin lead density, each of said output leads having an inner conductor pair insulated from one another and an outer shield; a plurality of first switcing means in close proximity to said test socket means for selectively terminating said output leads in a predetermined characteristic impedance; signal sourcing and receiving means for sending and receiving pulses and d.c. signals; a plurality of leads having an inner conductor pair insulated from each other and an outer shield for connecting to said output leads at the locations of said plurality of first switching means; second

switching means for selectively connecting said signal sourcing and receiving means to said connecting leads and for short-



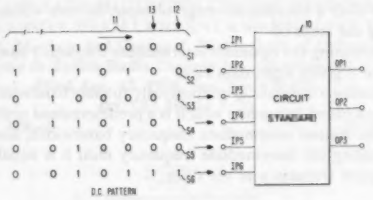
ing said inner conductor pairs to provide said characteristic impedance for said signal sourcing and receiving means.

4,045,736

METHOD FOR COMPOSING ELECTRICAL TEST PATTERNS FOR TESTING AC PARAMETERS IN INTEGRATED CIRCUITS

Robert Gordon Carpenter, and Chester C. Chao, both of Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Sept. 27, 1971, Ser. No. 184,145
Int. Cl.[2] G01R *31/22*
U.S. Cl. 324—158 R **14 Claims**



1. A method for composing electrical test patterns for testing AC parameters in integrated semiconductor circuits comprising:

applying to a plurality of input points in a standard of the circuit to be tested, the first increment of a bilevel DC electrical signal input pattern, the increments of which each comprise a plurality of parallel bilevel signals, each signal being respectively applied to one of said plurality of input points;

sensing, as at least one output point in said circuit standard, the bilevel output signal resulting from said input pattern increment;

changing the level of one of said parallel signals in said increment from its original level to the other of the two levels while maintaining the remaining parallel signals at their original levels;

determining whether said change in said input increment signal produces a corresponding change in one bilevel output signal;

if there is such a change in said output signal, storing, as part of said AC test pattern being composed, an increment comprising said bilevel DC increment in which said signal which produced the change is pulsed and the remaining signals are maintained at their original levels, said AC increment providing a test for the input point to which said pulsed signal is applied;

repeating said procedure by changing the level of different ones of said parallel signals in said input increment while maintaining the remaining signals at their original levels until one of said changes produces a corresponding output signal change and then recording and storing, as part of an AC test pattern, an increment in which the change producing signal is pulsed and the remaining signals are maintained at their original levels;

then applying to said plurality of input points, a second increment of said DC signal input pattern, and repeating said procedure of determining whether changing the level of different ones of the parallel signals in said second increment produces a corresponding output change, and then storing and recording an appropriate AC pattern increment in accordance with said procedure; and,

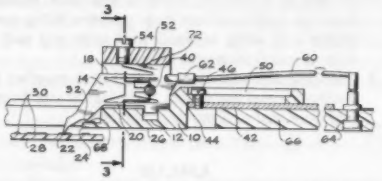
repeating said procedures of changing different ones of parallel signals in a sequence of applied DC input pattern increments until there is recorded and stored a plurality of the AC test pattern increments such that there is at least one AC pattern increment in which a pulsed signal is applied to each of the input points preselected to be AC tested.

4,045,737

INTEGRATED CIRCUIT PROBE

Charles Wheeler Coberly, No. 6 Oak Knoll Terrace, Pasadena, Calif. 91106

Filed Dec. 22, 1975, Ser. No. 643,298
Int. Cl.[2] G01R *1/06, 31/02*
U.S. Cl. 324—158 P **10 Claims**



1. In an apparatus for making pressure electrical connections at a plurality of precisely located points on an exposed circuit lying in substantially a single plane, the improvement comprising:

an insulative substrate having a linear groove extending from one surface a limited extent into the substrate, said groove being parallel to the edge of the substrate,

a plurality of generally-parallel sheet-like contacts of conductive spring material each having a key portion which is received edgewise within the groove and having edge portions extending beyond the edge of the substrate and outwardly thereof beyond an outer substrate surface; and

between and abutting each of said sheet-like contacts, a spacer of predetermined thickness and comprising a thin generally coextensive layer of dielectric insulating material;

said exposed circuit plane being located at the substrate edge such that the contact edge portions are resiliently urged substantially normally against respective portions of the circuit completing connection with collateral circuit apparatus.

4,045,738

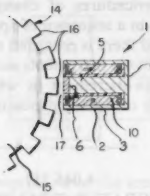
VARIABLE RELUCTANCE SPEED SENSOR OF INTEGRAL CONSTRUCTION UTILIZING A SHIELDED HIGH COERCIVE FORCE RARE EARTH MAGNET POSITIONED DIRECTLY ADJACENT THE SENSING ROTATING ELEMENT

Colby E. Buzzell, Wilmington, Mass., assignor to General Electric Company, Wilmington, Mass.

Filed Mar. 8, 1976, Ser. No. 665,047
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—174 **9 Claims**

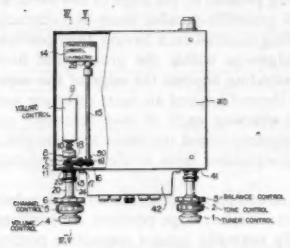
1. A variable reluctance speed sensing device for measuring the speed of a moving element including, in combination:

a. a thin, disc shaped, rare earth permanent magnet of thickness L and diameter D for producing magnetic flux for passage through a moving member,
b. an integral housing formed of a ferromagnetic material to provide a return path for the magnetic flux, comprising:
1. wall means to provide a return flux path for the flux from said magnet after passage through a moving element,
2. a base member connecting said wall means,
3. a core member extending from said base and positioned



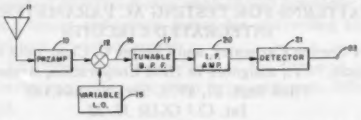
re-entrantly within said wall means for supporting said magnet at the free end thereof whereby said magnet may be positioned directly adjacent to a moving member to establish a flux path from said magnet across an air gap to a moving member and back through said housing; said re-entrant core member being positioned within said walls to shield said core and said magnet from external magnetic effects,
4. a sensing coil supported on said core member for producing a signal due to flux variations in said housing and said core due to a moving member.

4,045,739
COMBINED TRANSCEIVER AND RADIO UNIT
Kazuo Kawasaki, Kitakata, Japan, assignor to Nissan Denshi Kabushikigaisha, Omiya, Japan
Filed June 10, 1976, Ser. No. 694,602
Int. Cl.[2] F16H *35/18*
U.S. Cl. 325—15 **3 Claims**



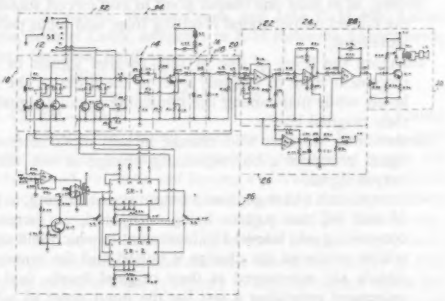
1. A combined transceiver and radio unit, incorporating a transceiver, having a channel changing mechanism, a radio, having a tuner, a tone control and a balance control, and a volume control, the transceiver, radio and volume control being enclosed in a common housing, having a front wall, for conjoint mounting, said unit comprising, in combination, said front wall being elongated and formed with an opening therethrough adjacent one end thereof and a slot therethrough adjacent the opposite end thereof; respective coaxial tuner, tone control and balance control shafts extending through said opening for connection to the tuner, the tone control and the balance control, respectively; respective operating knobs secured to the outer ends of said coaxial shafts, whereby the radio controls are conveniently grouped adjacent said one end of said front wall; a volume control shaft having an inner end connected to said volume control and having an outer end; a channel control shaft having an inner end connected to said channel changing mechanism and having an outer end; a tubular outer shaft extending through said slot and having inner and outer ends; gear means connecting the inner end of said tubular shaft to the outer end of said channel control shaft; an inner shaft extending coaxially through said tubular outer shaft and having inner and outer ends; coupling means connecting the inner end of said inner shaft to the outer end of said volume control shaft; and respective operating knobs secured to the outer ends of said coaxial tubular and inner shafts, whereby the transceiver channel control and the volume control are conveniently grouped adjacent said opposite end of said front wall.

4,045,740
METHOD FOR OPTIMIZING THE BANDWIDTH OF A RADIO RECEIVER
Kenneth L. Baker, Littleton, Colo., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 28, 1975, Ser. No. 625,807
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—427 **3 Claims**



1. A method for optimizing the bandwidth of a radio receiver over a continuous range of input bit rate values, comprising the steps of:
determining the optimum intermediate frequency bandwidth for a given input data rate,
adjusting a constant Q continuously tunable bandwidth filter to a tuned frequency which is a predetermined multiple of the desired intermediate frequency bandwidth, and
adjusting the intermediate frequency until it is equal to the tuned frequency of the filter.

4,045,741
SCANNING RECEIVER FOR USE IN A TOUR GUIDE SYSTEM
John V. Missale, 48-16 47th St., New York, N.Y. 11377
Filed Sept. 26, 1974, Ser. No. 509,564
Int. Cl.[2] H04B *1/32*
U.S. Cl. 325—470 **9 Claims**



1. An improved portable radio receiver for receiving a plurality of preselected frequencies, said receiver comprising:
an antenna for receiving said pre-selected frequencies;
a tuning means comprising a tank-type resonant circuit including at least one inductance and at least a plurality of

capacitance elements connected therewith, said tuning means being connected to said antenna;

a detecting means for detecting signals from said tuning means; and,

an audio transducer stage for producing an audio output in response to the output of said detecting means; and,

an automatic frequency selecting means for scanning said pre-selected frequencies and for automatically tuning said receiver to the first one of said pre-selected frequencies whose signal strength exceeds a predetermined amplitude, said automatic frequency selecting means including:

a level detector for providing a specified output whenever the amplitude of the signal received from the detecting means exceeds a predetermined threshold;

an oscillator having an input connected to the output of said level detector;

a counter circuit comprising a shift register having a plurality of outputs, each output corresponding to a stage of said shift register, said counter circuit having an input connected to the output of said oscillator;

a switching means comprising a plurality of switch means each having an input connected to one of said outputs of said counter circuit, said switching means comprising a plurality of field effect transistors, each of which is connected to one of said capacitive elements of said tank circuit, said switching means being connected in circuit with said tuning means; and,

a delay means for loading a beginning bit into said shift register after said receiver has been turned on.

4,045,742

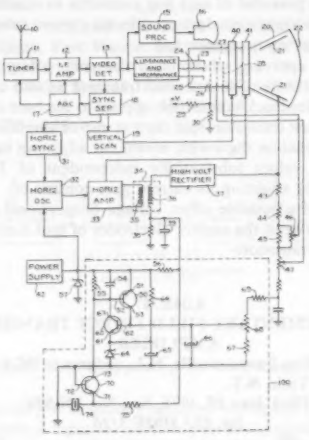
HIGH VOLTAGE SHUTDOWN CIRCUIT RESPONSIVE TO EXCESSIVE BEAM CURRENT AND HIGH VOLTAGE

David H. Meehan, and George J. Tzakis, both of Chicago, Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 12, 1976, Ser. No. 675,680

Int. Cl.[2] H02H *7/20*

U.S. Cl. 328—9 **9 Claims**



1. For use in a television receiver having a cathode ray tube display device in which one or more electron beams are directed to a viewing screen, means causing said beams to scan said screen, and high voltage generating means producing an electron accelerating potential for said cathode ray tube, high voltage shutdown means comprising:

high voltage detecting means producing a first error signal when said accelerating potential exceeds a predetermined voltage;

beam current detecting means producing a second error signal when the current of said electron beams exceeds a predetermined level; and

high voltage disabling means, coupled to said high voltage detecting means and said beam current detecting means, said high voltage disabling means including common fault means for rendering said high voltage generating means inoperative in response to either said first or second error signals.

4,045,743

DETECTOR CIRCUITS

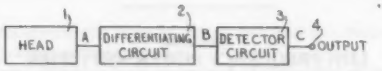
Keith Francis Walker, Woking, England, assignor to Data Recording Instrument Company Limited, Staines, England

Filed Apr. 22, 1976, Ser. No. 679,243

Claims priority, application United Kingdom, Apr. 24, 1975, 16930/75

Int. Cl.[2] H03K *5/153*

U.S. Cl. 328—150 **5 Claims**



1. A waveform-level detector useable in conjunction with an applied waveform having positive and negative excursions relative to a neutral axis to produce an output indicative of significant excursions of the applied waveform across the axis, and a zone lying between a pair of reference levels one on each side of the axis, the detector including;

means responsive to changes in polarity of the waveform to produce a stylised waveform output first signals for all the axis crossings;

first pulse forming means responsive to the stylised output to produce a first pulse train output in which each axis crossing of the applied waveform is represented by a different pulse, the relative timings of the pulses in the first train corresponding to the relative timings of the axis crossings;

means for delaying the first pulse train to enable the pulses each to occur a predetermined time interval after that axis crossing to which it corresponds;

means for deriving second signals from the applied waveform in respect of each transition of the applied waveform across each zone laying between the pair of reference levels; and

means for combining the delayed final pulse train and the second signals thereby to produce delayed signal outputs only in respect of significant axis crossings.

4,045,744

LOW-FREQUENCY POWER AMPLIFIER

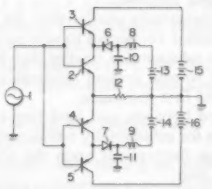
Tohru Sampei, Toyokawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 21, 1976, Ser. No. 734,602

Claims priority, application Japan, Oct. 24, 1975, 50-127392

Int. Cl.[2] H03F *3/183*

U.S. Cl. 330—13 **7 Claims**



7. In an amplifier circuit of high efficiency for use as an

output circuit of an amplifier comprising a first transistor for amplifying an incoming input signal applied to a base of said first transistor, a load connected to an emitter of said first transistor, a second transistor of the same conductivity type as that of said first transistor having an emitter connected to a collector of said first transistor, means for supplying the incoming input signal to a base of said second transistor, a first power source, a diode connected between the collector of said first transistor and said first power source in a manner so that said diode is forward-biased by said first power source and operatively applies a collector bias voltage to the collector of said first transistor so long as the diode is conducting, a second power source for producing a voltage higher than that of said first power source, and means for connecting said second power source to a collector of said second transistor,

an improvement which comprises:

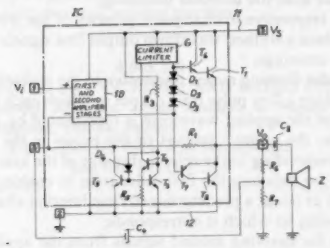
an impedance element connected in series to said diode and inserted in a circuit through which a collector current for said first transistor flows, whereby preventing a reverse current from flowing through said diode when said diode is cut off.

4,045,745

LOW-FREQUENCY POWER AMPLIFIER

Carlo Cini, Cornaredo (Milan); Bruno Murari, Monza (Milan), and Mario Santi, Sedriano (Milan), all of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Milan, Italy

Filed Mar. 31, 1976, Ser. No. 672,336
Claims priority, application Italy, Apr. 4, 1975, 21984/75
Int. Cl.[2] H03F *3/26*
U.S. Cl. 330—15 **2 Claims**



1. A power amplifier comprising:

an amplification network with several cascaded transistor stages including a first stage and a final stage, said first stage having a noninverting input terminal and an inverting input terminal;

an energizing circuit for said network including a supply terminal and a ground terminal connectable across a source of direct current;

a first power transistor and a second power transistor in said final stage connected between said supply terminal and said ground terminal, said power transistors being respectively provided with a collector and an emitter jointly connected to an output terminal, said power transistors having input circuits connected to said first stage;

a feedback resistor inserted between said output terminal and said inverting input terminal;

a first resistance substantially smaller than the magnitude of said feedback resistor connected to said output terminal;

a second resistance substantially smaller than said first resistance connected to said ground terminal and forming a junction with said first resistance;

a capacitor inserted between said inverting input terminal and said junction for substantially compensating the effect of supply-voltage fluctuations upon the voltage of said output terminal; and

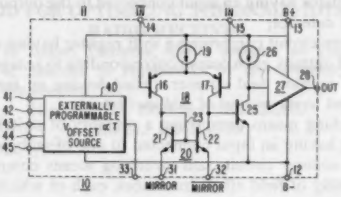
a voltage-stabilizing circuit with a pair of twin transistors having interconnected bases and grounded emitters, one of said twin transistors having a collector tied to said inverting input terminal, the other of said twin transistors having a collector connected to said supply terminal via a direct-current path independent of said input circuits including a further resistor of a magnitude substantially exceeding said first resistance.

4,045,746

ADJUSTABLE GAIN CURRENT AMPLIFIERS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,575
Int. Cl.[2] H03F *1/32, 3/45*
U.S. Cl. 330—23 **9 Claims**



1. A current mirror amplifier including:

an input terminal for receiving an input current;

an output terminal;

first and second transistors, each having base and emitter and collector electrodes and being operated within the confines of an integrated circuit at an absolute temperature substantially equal to T;

first conductive means connecting the collector electrode of said first transistor to said input terminal;

second conductive means connecting the collector electrode of said second transistor to said output terminal;

a collector-to-base feedback connection between the collector and base electrodes of said first transistor for adjusting the base potential of said first transistor to condition said first transistor to conduct as collector current substantially all of said input current; and

means for applying substantially the same potential to the base electrode of said second transistor as said collector-to-base feedback connection applies to the base electrode of said first transistor, said current mirror amplifier having in combination therewith, means for adjusting its current gain to values substantially independent of T, which means for adjusting its current gain consists of:

a source of adjustable offset voltage proportional to T applied between the emitter electrodes of said first and said second transistor.

4,045,747

COMPLEMENTARY FIELD EFFECT TRANSISTOR AMPLIFIER

Sheng Teng Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

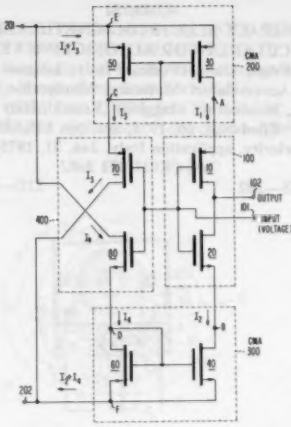
Filed June 25, 1976, Ser. No. 699,849
Int. Cl.[2] H03F *3/16*
U.S. Cl. 330—35 **18 Claims**

16. An amplifier, comprising:

first and second field effect transistors of first and second conductivity types, respectively, each having source, gate and drain electrodes, said gate electrodes being connected to a signal input terminal, said drain electrodes being connected to a signal output terminal;

first and second complementary current mirror amplifiers each having input, common output terminals, said common terminals for receiving an operating voltage thereacross, said output terminals being connected to respective ones of said source electrodes; and

input means for supplying input currents to the input terminals of said current mirror amplifiers and for controlling



the ratio thereof in accordance with an input signal applied to said input signal terminal.

4,045,748

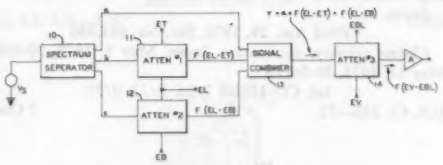
AUDIO CONTROL SYSTEM

Paul Filliman, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Dec. 19, 1975, Ser. No. 642,429

Int. Cl.[2] H03F *3/68*

U.S. Cl. 330—126 **8 Claims**



1. An audio control apparatus for controlling a signal comprising:

a. a plurality of frequency selective filters, said filters having a common input for receiving an audio signal;

b. a plurality of differential amplifiers for receiving said filter output signals each of said differential amplifiers providing biphase signal currents in response to an input voltage;

c. a plurality of attenuators for controlling said biphase signal currents produced by each of said differential amplifiers, said attenuators having a selectable attenuation level; and

d. means for combining said attenuator output signals to form a composite signal, said composite signal having a frequency spectrum dependent upon the relative attenuation levels provided by said attenuators.

4,045,749

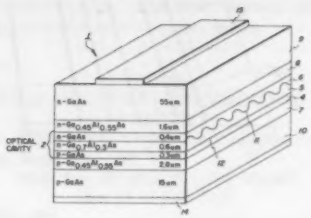
CORRUGATION COUPLED TWIN GUIDE LASER

Robert D. Burnham; Donald R. Scifres, both of Los Altos, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1975, Ser. No. 634,682

Int. Cl.[2] H01S *3/19*

U.S. Cl. 331—94.5 H **13 Claims**



1. An electrically pumped, distributed feedback, twin waveguide diode laser comprising:

a semiconductor body comprised of a plurality of contiguous layers of semiconductor material, one of said layers being the laser active region layer,

said active region layer being bounded on one side by a first layer and being bounded on another side by a second layer,

a third layer, said third layer being bound on one side by said second layer and being bounded on another side by a fourth layer,

said active region layer being of one conductivity type and one of the layers bounding said active region layer being of the other conductivity type such that a rectifying junction is provided between said active region layer and said one of the layers bounding said active region layer, carriers injected under forward bias across said rectifying junction undergoing radiative recombination in said active region layer to generate stimulated coherent radiation,

the material of said active region layer having a lower bandgap than the materials of both said first layer and said second layer such that confinement is provided for the carriers injected into said active region layer under forward bias,

the material of said third layer having a lower bandgap than the materials of both said second layer and said fourth layer such that the portion of said coherent radiation that spreads to said third layer is confined to said third layer,

one of said boundaries formed with said third layer being a non-planar boundary, said non-planar boundary providing a periodic perturbation of refractive index therealong which interacts with a portion of said radiation that spreads to said third layer to cause said portion of said radiation to be reflected by said periodic perturbation, said perturbation having a period such that said reflected radiation is in phase.

4,045,750

ELECTRICAL CABLE AND COUPLING ARRANGEMENT

Richard C. Marshall, Hertfordshire, England, assignor to Xerox Corporation, Stamford, Conn.

Filed May 20, 1976, Ser. No. 688,502

Claims priority, application United Kingdom, Oct. 16, 1975, 42422/75

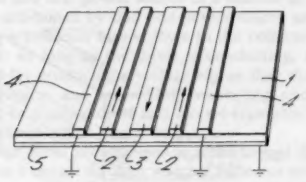
Int. Cl.[2] H03H *7/48, 1/00*

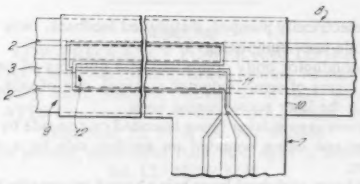
U.S. Cl. 333—6 **4 Claims**

1. An electrical cable having an adhesive coated surface portion, the cable comprising a continuous flat strip of flexible insulating material carrying:

a. a central first conductive strip and second and third con-

ductive strips on each side of and generally parallel to the first conductive strip in an electrically balanced configuration, the first conductive strip being for carrying current of one phase, the second and third conductive strips being for jointly carrying current of the opposite phase and each having a resistance per unit length which is twice the resistance per unit length of the first conductive strip, and





outermost fourth and fifth conductive strips on the outermost sides of and generally parallel to the second and third conductive strips, the fourth and fifth conductive strips being for connection to ground; and

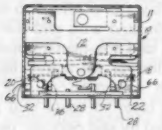
b. a conductive member spaced by the insulating material from the conductive strips, the conductive member constituting a ground plane for the cable.

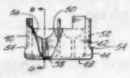
4,045,751

ARC BARRIER FOR A RELAY SWITCH

John C. Schuessler, and David J. Tapp, both of West Covina, Calif., assignors to Leach Corporation, Los Angeles, Calif.

Filed Mar. 22, 1976, Ser. No. 669,212
Int. Cl.[2] H01H *9/30*
U.S. Cl. 335—201 **6 Claims**





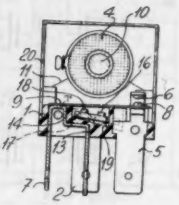
1. Apparatus for preventing arcing between the contacts and other conductive parts of a relay, comprising a molded housing of non-conductive material forming at least one substantially cubical space open on one end for receiving the relay contacts, one wall of the housing having an open slot extending from an edge at the open end, and a pair of spaced parallel retaining members having opposing clamping surfaces projecting toward each other, the housing being positioned between and in engagement with said surfaces, with the slotted wall extending laterally between the retaining members, the spacing between the clamping surfaces being slightly less than the width of the housing whereby the slotted wall of the housing is put in compression by the clamping members.

4,045,752

COMPACT ELECTROMAGNETIC RELAY, PARTICULARLY FOR AUTOMOTIVE VEHICLES

Domenico Frigo, Olmo (Venice), Italy, assignor to Fabbrica Italiana Accumulatori Motocarri Montecchio S.p.A. - F.I.A.M.M., Montecchio Maggione (Venice), Italy

Filed Nov. 26, 1975, Ser. No. 635,635
Claims priority, application Italy, Jan. 31, 1975, 19827/75
Int. Cl.[2] H01H *9/02*
U.S. Cl. 335—202 **14 Claims**



1. An electromagnetic relay comprising:

a base;

an electromagnetic yoke mounted on said base;

an armature underneath said yoke normally resting on said base with freedom of vertical movement, said yoke having a pair of generally vertical legs terminating above said armature and forming therewith a pair of air gaps;

coil means on said yoke for magnetizing same to attract said armature toward said legs;

a first contact member of said base spacedly overlying said armature in the de-energized state of said yoke; and

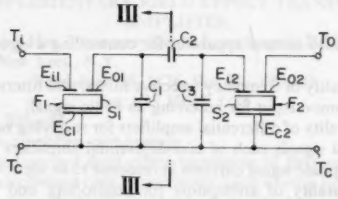
a second contact member on said base coacting with said first contact member, said first contact member being biased into a substantially horizontal normal position and being engageable by said armature of elevation into an alternate position relative to said second contact member upon energization of said yoke.

4,045,753

CERAMIC FILTER

Koji Arakawa, Kawagoe, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Apr. 29, 1976, Ser. No. 681,486
Claims priority, application Japan, May 9, 1975, 50-65008; May 13, 1975, 50-56935
Int. Cl.[2] H03H *9/26, 9/32, 9/20*
U.S. Cl. 333—72 **7 Claims**



1. A ceramic filter including at least two three-terminal, dual-mode ceramic filter elements each having an input and an output and a ground connection, and a capacitive coupling circuit comprising first capacitive means connected between the input of one of said filter elements and the output of the other of said filter elements and second capacitive means con-

nected between said first capacitive means and the respective ground connection.

4,045,754

ECCENTRICALLY MOUNTED SIX-POLE RINGS FOR A STATIC CONVERGENCE UNIT

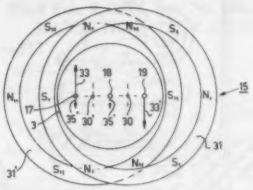
Piet Gerard Joseph Barten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,046

Claims priority, application Netherlands, Mar. 13, 1977, 7502970

Int. Cl.[2] H01F *1/00*

U.S. Cl. 335—212 6 Claims



1. In combination with a color display tube having three electron guns arranged in a single plane, a device for the static convergence of electron beams generated by the electron guns, said device enclosing the neck of the color display tube and comprising at least two annular magnetic six-pole structures, which are arranged eccentrically with respect to the neck of the color display tube and to each other, the axis of rotation of a first of said magnetic structures being situated halfway between one outer electron beam and the central electron beam and the axis of the second magnetic structure being situated halfway between the central electron beam and the other electron outer beam.

4,045,755

ARMATURE MOUNTING MEANS FOR AN ELECTROMAGNETIC RELAY

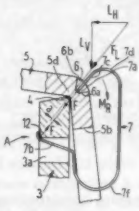
Harry Schroëder, Unterhaching, and Martin Aidn, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 17, 1976, Ser. No. 751,807

Claims priority, application Germany, Dec. 22, 1975, 2558065

Int. Cl.[2] H01F *7/08*

U.S. Cl. 335—274 7 Claims



1. An electromagnetic relay comprising an armature having a first leg portion, a second leg portion extending at an angle to said first leg portion and a corner portion interconnecting said first and second leg portions, said corner portion having an inner surface and an outer surface, said inner surface having means forming a mounting edge and said outer surface having means forming a recess, a return pole piece having an outer surface disposed adjacent said second leg portion of said armature, an inner surface and means forming a supporting edge for receiving said mounting edge of said armature and for supporting said armature for pivotal movement, said second leg of said armature having means forming an aperture therein, and an elongated curved mounting spring for clamping said armature to said return pole piece and having a first end portion abutting said corner portion of said armature in said recess, a middle portion extending through said aperture and a second end portion disposed in spaced relation to said first end portion and abutting said return pole piece on said inner surface for biasing said mounting edge of said armature into abutting engagement with said supporting edge of said return pole piece, said mounting edge of said armature and said supporting edge of said return pole piece residing substantially between said first and second leg portions of said mounting spring.

4,045,756

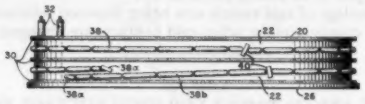
SEGMENTED EXPANSION ABSORBER FOR LIFTING MAGNET

Armand G. Mueller, Elm Grove, Wis., assignor to Square D Company, Park Ridge, Ill.

Filed July 13, 1976, Ser. No. 704,907

Int. Cl.[2] H01F *7/20*

U.S. Cl. 335—292 6 Claims



1. A lifting magnet, comprising: a magnet case having a sealed cavity; a magnet coil mounted within the cavity; potting compound encapsulating the magnet coil and substantially filling any remaining voids in the cavity; and means for absorbing the compressive forces acting upon the encapsulating compound due to expansion of the magnet coil during its operation, said means comprising individual hermetically sealed compartments serially connected to each other and each containing a predetermined volume of compressible fluid generally arranged and disposed to substantially surround the coil in order to provide a predetermined number of compartments, if none are punctured, providing a volume of compressible fluid in excess of said predetermined volume, whereby some segments can be disabled in the course of fabrication, assembly and encapsulation of the magnet and coil without rendering the entire absorbing means inoperative.

4,045,757

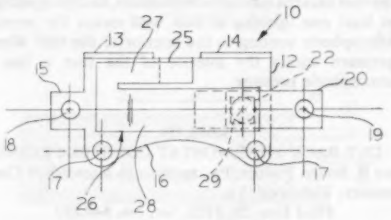
THERMOSTATIC SWITCH

Robert A. Johnson, Shelby, N.C., assignor to Fasco Industries, Inc., Boca Raton, Fla.

Filed May 3, 1976, Ser. No. 682,500

Int. Cl.[2] H01H *37/52*

U.S. Cl. 337—85 3 Claims



1. A thermostatic switch, comprising

a metal support having thereon a plane surface,

a generally J-shaped, bimetallic switch arm having a pair of spaced parallel, generally flat legs integral with each other at their inner ends, and movable relative to each other at their outer ends,

means for securing the outer end of one of said legs in elec-

trical contact with said support and with said one leg supporting the other leg of said switch arm in spaced, confronting relation to said plane surface on said support,

a first metal contact mounted on said support beneath the outer end of said other leg of said switch arm,

a second metal contact secured to said outer end of said other leg for movement thereby to a closed position in which it engages said first metal contact, and to an open position in which it is spaced from said first contact,

means electrically insulating said first contact from said metal support, and means for connecting said metal support and said first contact in an electrical circuit to pass current from said circuit through said contacts and from one end to the other of said switch arm, when said contacts are engaged,

said one leg of said switch arm being substantially shorter and narrower than said other leg,

said switch arm having its high expansion side facing said plane surface of said support, and said shorter leg of said switch arm being operative to resist movement of said longer leg in a direction to move said second contact from its open to its closed position, and

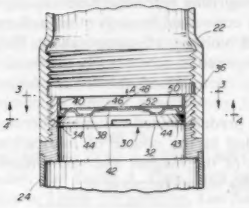
the two legs of said switch arm being disposed substantially in a common plane when said contacts are engaged.

4,045,758

VALVE ARRANGEMENT FOR HIGH VOLTAGE FUSE

Bruce A. Biller, Chicago, and Henry W. Scherer, Mount Prospect, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Nov. 11, 1976, Ser. No. 741,024
Int. Cl.[2] H01H *85/20*
U.S. Cl. 337—186 **14 Claims**



1. A valve arrangement for permitting one way atmospheric venting to the interior of a high voltage fuse comprising:

wall means for closing an open end of the fuse, said wall means having at least one opening therethrough communicating between the interior of the fuse and the atmosphere;

valve means cooperating with said wall means for sealing said at least one opening when the pressure within the interior of the fuse exceeds atmospheric pressure, and for opening said at least one opening in said wall means for permitting atmospheric venting to the interior of the fuse when the pressure within the interior of the fuse is less than atmospheric pressure.

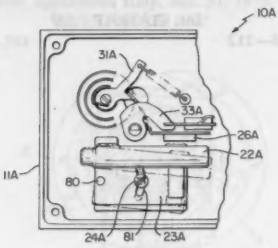
4,045,759

CUT-BACK THERMOSTAT CONSTRUCTION

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 29, 1975, Ser. No. 644,611
Int. Cl.[2] H01H *37/62*
U.S. Cl. 337—301 **17 Claims**

1. A cut-back thermostat construction having a frame means, a timer means carried by said frame means, a thermostat arrangement carried by said frame means, movable actuator means carried by said frame means and being operatively associated with said thermostat arrangement to cut back the temperature setting thereof when said actuator means is moved from a first position thereof to a second position thereof, said timer means having cut-back means for engaging and moving said actuator means from said first position thereof to said second position thereof when a predetermined time is reached by said timer means whereby the temperature setting of said thermostat arrangement is cut back at said predetermined time, said thermostat arrangement comprising an electrical switch means carried by said frame means and a temperature responsive switch operator movably carried by said frame means for operating said switch means in accordance with sensed temperature, said actuator means cutting back said temperature



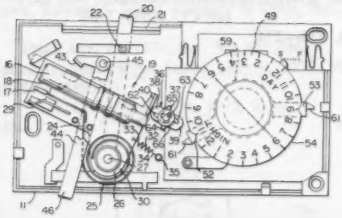
setting of said thermostat arrangement by adjusting said temmperature responsive switch operator relative to said switch means, and an adjustable cam being carried by said frame means and being operatively associated with said temperature responsive switch operator to set the same to provide said temperature setting of said thermostat arrangement, said switch operator having a cam follower operatively associated with said cam for following the adjustment thereof, said actuator means including a movable wedge member disposed between and in engagement with said cam follower and said cam.

4,045,760

CUT-BACK THERMOSTAT CONSTRUCTION

Edgar E. Marquis, Newtown, and William A. Knecht, New Hartford, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 29, 1975, Ser. No. 644,599
Int. Cl.[2] H01H *37/62*
U.S. Cl. 337—301 **20 Claims**



1. In a cut-back thermostat construction having a thermostat arrangement and a timer means carried by a frame means in such a manner that said timer means will cut-back the temperature setting of said thermostat arrangement by moving an electrical switch means of said thermostat arrangement relative to a temperature responsive switch operator of said thermostat arrangement when a predetermined time is reached by said timer means, said construction also having movable actuator means that is carried by said frame means and is operatively associated with said switch means to be adapted to cause a certain movement of said switch means relative to said switch operator when said actuator means is moved from a first position thereof to a second position thereof by said timer means when said predetermined time is reached by said timer means,

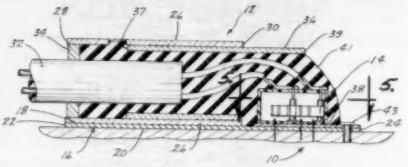
the improvement comprising adjustable means carried by said frame means and being separate from said actuator means for selecting the amount of movement of said switch means relative to said switch operator when said actuator means is moved from said first position thereof to said second position thereof whereby said adjustable means selects the cut-back temperature of said thermostat arrangement.

4,045,761

MOUNTING BRACKET FOR A HEAT DETECTOR SWITCH

Reuben E. Peterson, Fergus Falls, Minn., assignor to Jenoff, Incorporated, Fergus Falls, Minn.

Filed Feb. 9, 1976, Ser. No. 656,353
Int. Cl.[2] H01H *37/04, 37/56*
U.S. Cl. 337—372 **5 Claims**



1. In combination with a member requiring heat monitoring, comprising,
- a first flat plate member having top and bottom surfaces and first and second ends,
- a hollow tubular member mounted on the top surface of said first plate member, said tubular member having first and second ends,
- a heat sensing means mounted on said first flat plate member adjacent said second end thereof,
- an electrical wire means extending through said tubular member from said first end thereof and being electrically connected to said heat sensing means,
- protective means extending over said heat sensing means for preventing damage thereto,
- said first flat plate member being heat conductive,
- means operatively mounting said first flat plate member to the member requiring heat monitoring,
- said electrical wire means adapted to be operatively connected to a signal means which is activated by said heat sensing means when the member requiring heat monitoring reaches a predetermined temperature which is transmitted through said first plate member to said heat sensing means,
- said heat sensing means having a second flat plate member mounted on the bottom thereof,
- said second flat plate member having at least one opening formed therein, said first flat plate member having at least one opening formed therein which registers with the opening in said second flat plate member,
- said mounting means comprising a connector means extending through the openings in said first and second plate members.

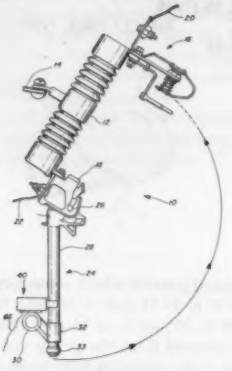
4,045,762

REMOTE CONTROL FUSE CLOSING DEVICE

John F. Foulkes, Elmhurst, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Sept. 19, 1975, Ser. No. 615,061
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—401 **14 Claims**

1. A device for causing a switching element of an electrical switching device in an electrical circuit to move the switching element from a first position representative of a first circuit condition to a second position representative of a second circuit condition comprising:
- rocket means for being ignited to generate propelling forces to move the switching element from the first position to the second position in response to ignition of said rocket means;



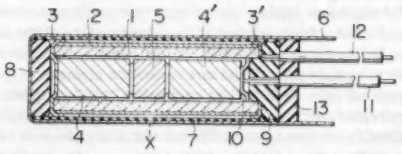
- connector means connected to said rocket means for directly and disengageably attaching the rocket means to the switching element so that said rocket means disengages the switching element when the switching element moves to the second position; and
- activating means for igniting the rocket means in response to remote actuation.

4,045,763

SEALED THERMOSTATIC HEATER

Mamoru Miyamoto, Neyagawa, and Kazuo Ishikawa, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 19, 1975, Ser. No. 633,230
Claims priority, application Japan, Nov. 20, 1974, 49-141083[U]; Jan. 20, 1975, 50-9624[U]
Int. Cl.[2] H01C *7/02*
U.S. Cl. 338—23 **4 Claims**

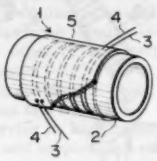


1. A sealed thermostatic heater comprising a ceramic tube having at least one PTC thermistor and at least two metallic radiators housed therein, said PTC thermistor being held by and between said radiators, said ceramic tube being sealed in a metal tube, and PTC thermistor and a heater in said metal tube being electrically connected in series.

4,045,764
GAS-SENSING MATERIAL

Noboru Ichinose, Yokohama; Yuji Yokomizo, Tokyo, and Masaki Katsura, Mitaka, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,575
Claims priority, application Japan, Oct. 15, 1974, 49-117715; Feb. 13, 1975, 50-17419
Int. Cl.² H01L 7/00
U.S. Cl. 338—34 8 Claims

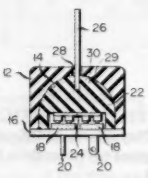


1. A gas-sensing material which comprises a sinter consisting essentially of 20 to 99.85 mol % of ZnO, 0.1 to 50 mol % of MgO and 0.05 to 30 mol % of Me_2O_3 wherein, Me is at least one element selected from the group consisting of gallium, boron, indium, iron, aluminum and chromium.

4,045,765
SLIDING RESISTOR

Masao Imamura, 18-15, 1-chome, Ikegami, Ota, Tokyo, Japan

Filed Jan. 19, 1977, Ser. No. 760,354
Claims priority, application Japan, Jan. 23, 1976, 51-7146[U]
Int. Cl.² H01C 10/38
U.S. Cl. 338—176 12 Claims

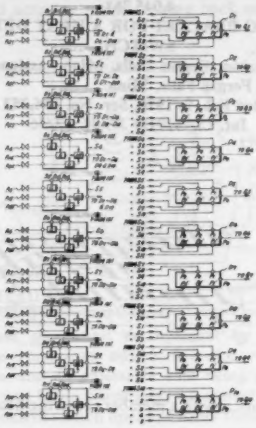


1. A sliding resistor comprising:
a base plate provided with at least one resistance element connected to connectors;
a molded slider provided with a contact piece formed of a leaf spring and mounted on the bottom plane of the slider for abutment against the at least one resistance element, and a slider knob erected at the upper surface of the slider and adapted to permit the contact piece to slide in abutment against the at least one resistance element;
a molded case fixed to the surface of the base plate and provided with a groove in which the molded slider is slidably received, and a slit cut out along the axis of the case for communication with the groove, for guiding the sliding of the slider knob, the slider knob projecting upward from the slit and the molded slider being pressed against the inner wall of the molded case by a biassing force resulting from the leaf spring contact piece; and
means for preventing the vertical joltings of the molded slider by causing it to contact with the inner wall of the groove of the molded case in a non-horizontal direction.

4,045,766
ULTRASONIC DETECTION SYSTEM

Masajiro Iida; Hideharu Morimatsu, both of Takarazuka; Itsuo Fukuoka, and Yoshinari Yoshida, both of Nishinomiya, all of Japan, assignors to Furuno Electric Company, Limited, Japan

Filed Jan. 21, 1976, Ser. No. 651,182
Claims priority, application Japan, Jan. 30, 1975, 50-13084
Int. Cl.² G01S 9/66, 7/62
U.S. Cl. 340—1 R 3 Claims



1. An ultrasonic detection system, comprising means for emitting an ultrasonic wave signal in all peripheral directions, a plurality of ultrasonic transducers arranged circularly at equal intervals for receiving said ultrasonic wave signals reflected back from said directions, a plurality of composite output circuits for combining the outputs of k ($k>1$) transducers which are successively adjoining in a predetermined circumferential direction to produce a plurality of directive composite outputs, and means for deriving said composite outputs sequentially in time division fashion for indications; said ultrasonic transducers being classified into m groups each consisting of n transducers which are successively adjoining in said circumferential direction, the number of said composite output circuits being designated as n, where m and n are integers greater than one and n is equal to or greater than k, n switching circuits each having m inputs connected respectively to the outputs of the j-th ($j = 1,2, \ldots n$) transducers of said m groups of transducers, said switching circuits being connected to said composite output circuits such that n sequential combinations of switching circuits each consisting of k switching circuits which are circulatingly adjoining in said circumferential direction are coupled sequentially to said composite output circuits, and control means for deriving n outputs at a time from said switching circuits which are circulatingly adjoining in said circumferential direction and, at the same time, shifting said n outputs one by one in said circumferential direction.

4,045,767
METHOD OF ULTRASONIC DATA COMMUNICATION AND APPARATUS FOR CARRYING OUT THE METHOD

Motohisa Nishihara, and Tetsuo Ito, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

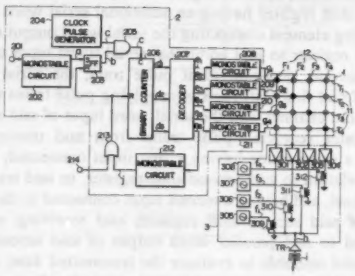
Filed Sept. 18, 1973, Ser. No. 398,474
Claims priority, application Japan, Sept. 20, 1972, 47-93622
Int. Cl.² G01V 1/00; H04B 13/00, 15/00
U.S. Cl. 340—5 R 9 Claims

1. An ultrasonic data communication system comprising:
first means for generating at least three respectively different ultrasonic frequency signals;
second means, coupled to said first means, selectively encod-

ing information to be transmitted in accordance with any selected one of the permutations of the possible sequences of the frequencies of said at least three respectively different ultrasonic frequency signals;

third means, coupled to said first means and said second means, for transmitting a selected permutation of said frequency signals, all of the frequency components of which define the information to be transmitted, by transmitting each frequency signal in its encoded order in the selected permutation for a prescribed period of time;

fourth means, for receiving the frequency signals transmitted by said third means;



fifth means, coupled to said fourth means, for separating the respective frequency signals making up the selected permutation received by said fourth means;

sixth means, coupled to said fifth means, for detecting the frequency components in said separated frequency signals, and

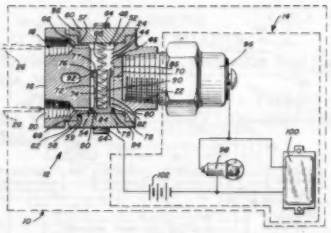
seventh means, coupled to said sixth means, for decoding said information in accordance with the order in which said frequency components have been detected by said sixth means.

4,045,768

LOW PRESSURE SELECTOR

Boleslaw M. Klimek, Des Plaines, Ill., assignor to The Echlin Manufacturing Company, Branford, Conn.

Filed Sept. 9, 1976, Ser. No. 721,818
Int. Cl.² B60T *17/22*
U.S. Cl. 340—52 C **18 Claims**



13. Low pressure indicator apparatus for monitoring at least two sources of supply pressure in a vehicle pneumatic brake system, comprising:

a housing, including a cavity formed by walls therein and first, second and third ports, said second and third ports being adapted for connection to said sources of supply pressure and all of said ports communicating with said cavity;

piston means mounted for reciprocating movement within said cavity between first and second positions in response to pressure appearing at said second and third ports, a drop in pressure appearing at said third port relative to pressure appearing at said second port causing said piston means to move to said first position and a drop in pressure appearing at said second port relative to pressure appearing at said third port causing said piston means to move to said second position, said piston means including sealing means for cooperation with said walls forming said cavity to permit communication between said first port and said third port and prevent communication between said first port and said second port when said piston means is in said first position and to permit communication between said first port and said second port and prevent communication between said first port and said third port when said piston means is in said second position; and

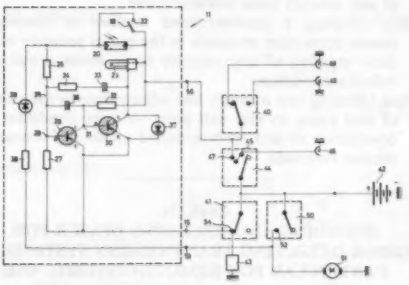
pressure responsive monitoring means connected to said third port for signaling reduction in pressure appearing at said third port below a preset minimum.

4,045,769

LIGHTING SYSTEMS FOR VEHICLES

Hermann Faller, Guetenbach, Germany, assignor to Faller OHG, Guetenbach, Germany

Filed Mar. 30, 1976, Ser. No. 671,934
Claims priority, application Germany, Apr. 3, 1975, 2514611
Int. Cl.² B60Q *1/26, 1/08*
U.S. Cl. 340—74 **21 Claims**



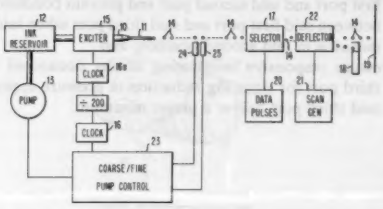
1. A light dependent device for use in a motor vehicle having regulation lights, a lighting circuit and an ignition switch, said device being operative to monitor the environmental light and the condition of the ignition switch and provide warning when the regulation lights on the vehicle should be switched on or off, said device comprising a light sensor and a switching element including a warning device, the light sensor being connected to the switching element which is adapted to be connected to the lighting circuit and ignition switch of the vehicle and, in use, to switch when the intensity of the light falling on the light sensor passes a level at which the regulation lights on the vehicle should be switched on, the warning device being arranged to be activated by the switching element (1) when the light intensity falls below said level with the ignition switch on and the regulation lights off, and (2) when the ignition switch is turned off with the regulation lights on; and to be deactivated by the switching element (1) when the light intensity exceeds said level with the ignition switch on and regulation lights off, (2) when the regulation lights are switched on with the ignition switch on and light intensity below said level, and (3) when the regulation lights are switched off with the ignition switch off.

4,045,770

METHOD AND APPARATUS FOR ADJUSTING THE VELOCITY OF INK DROPS IN AN INK JET PRINTER

Robert Walker Arnold, Glen Aubrey, and Thomas Tomasky, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,703
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 12 Claims



1. In an ink jet printing apparatus, the combination comprising

jet forming means for projecting a continuous stream of ink drops along a path toward a print medium,

pump means connected to said jet stream forming means for supplying a liquid ink under pressure to said jet forming means,

a method for controlling the velocity of said ink drops comprising

determining the existence and direction of any velocity error in said ink drops,

effecting one or more coarse adjustments in a first direction in the pressure of said pump until a change in the direction of any velocity error occurs,

then effecting a predetermined number of consecutive coarse correction reversals in the pump pressure to produce toggling of any velocity error about a null point velocity condition,

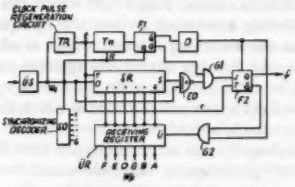
then effecting one or more fine adjustments in the pressure of said pump to said null point velocity condition after completion of said predetermined number of coarse correction reversals.

4,045,771

ENCODING AND DECODING DEVICE FOR ERROR-DETECTING TRANSMISSION SYSTEMS, IN PARTICULAR FOR REMOTE-CONTROL AND REMOTE-ACTUATION EQUIPMENTS

Heinz Loreck, Kronberg, Taunus, Germany, assignor to Helmut Leinfellner, Austria

Filed Jan. 22, 1976, Ser. No. 651,254
Claims priority, application Austria, Jan. 22, 1975, 451/75
Int. Cl.[2] G06F *11/00;* G08C *25/00*
U.S. Cl. 340—146.1 BA 14 Claims



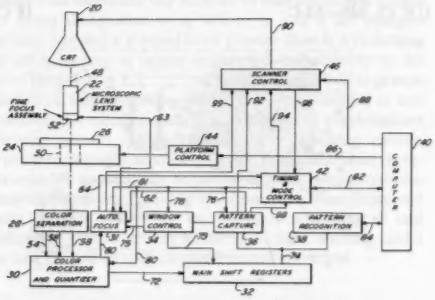
1. In an error detecting transmission system, for conveying information by means of pulse trains, of the type including an input transmitter, for the pulse train to be transmitted, incorporating a device for temporary storage and repetitive transmission of the pulse train to a transmission channel, and a receiver, receiving the pulse train from the transmission channel, incorporating a device for temporary storage of the first-received pulse train, and incorporating a comparator for comparing each received and temporarily stored pulse with the respective received associated pulse of the repeated pulse train, and incorporating a receiving register with an information output in which the information output is controlled as a function of the result of such comparison: the improvement comprising, in combination, a first shift register in said transmitter having a control input, a parallel word input and a serial word output; a second shift register in said receiver having a serial word input and serial word and parallel word outputs; said shift registers constituting said temporary storage devices; means supplying timing pulses to both shift registers to synchronize the same; said first shift register having an additional serial word input; an inverting element connecting the serial word output of said first shift register to said additional serial word input to produce a second, non-equivalent pulse train; the serial word output of said first shift register supplying pulse trains to said transmission channel, and the serial word input of said second shift register receiving pulse trains from said transmission channel; a comparator having a first input connected, in bypassing relation to said second shift register, to said transmission channel, and having a second input connected to the serial output of said second shift register; said receiving register connected to said parallel word output of said second shift register and operable to evaluate the transmitted data; and an error signal storage connected to the output of said comparator and to said receiving register; said comparator detecting transmission errors and transferring the same, as error signals, to said error signal storage; said error signal storage, upon receipt of an error signal, preventing evaluation of the transmitted data in said receiving register.

4,045,772

AUTOMATIC FOCUSING SYSTEM

John C. Bouton, Doylestown; Melvin E. Partin, Newtown Square, both of Pa., and Robert C. Hilghman, Willingboro, N.J., assignors to Geometric Data Corporation, Wayne, Pa.

Division of Ser. No. 465,390, April 29, 1974, Pat. No. 4,012,634.
This application Apr. 22, 1976, Ser. No. 679,259
Int. Cl.[2] G06K *9/08*
U.S. Cl. 340—146.3 B 11 Claims

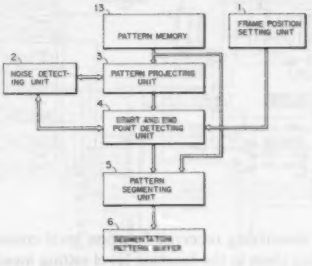


1. A pattern recognition system including scanning means for scanning a field including a plurality of patterns to be recognized and classified and an optical instrument for enabling scanning of said field, means responsive to said scanning means for generating a signal in accordance with the color density of the field scanned, means responsive to said signal for causing said scanning means to rescan an area of said field when one of said plurality of patterns is detected and means responsive to said signal during said rescan for moving said optical instrument to its optimum focus position before each one of said plurality of patterns is classified.

4,045,773
PATTERN SEGMENTING SYSTEM FOR A PATTERN RECOGNIZING DEVICE

Shozo Kadota; Yoshiji Fujimoto, both of Hachioji; Michio Yasuda, Koganei, and Mitsunori Oka, Hatano, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 13, 1975, Ser. No. 631,620
Claims priority, application Japan, Nov. 13, 1974, 49-129965
Int. Cl.² G06K *9/02*
U.S. Cl. 340—146.3 SG **8 Claims**

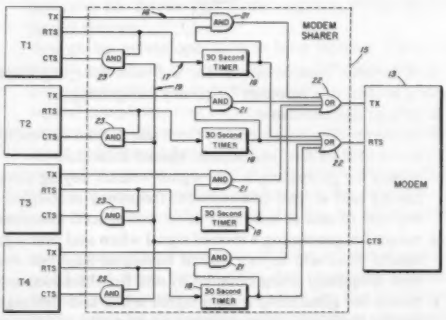


1. A pattern segmenting system comprising:
a memory for storing at least one information pattern;
first means for reading out the information pattern from said memory;
second means for detecting the start and end positions of at least one subpattern in the information pattern read out from said first means;
third means for calculating the center position of the subpattern in accordance with the start and end positions detected by said second means;
fourth means for storing the end position of a selected pattern frame;
fifth means for detecting whether or not the center position of the subpattern is within the selected pattern frame by comparing said center position with said end position of said selected pattern frame; and
sixth means for segmenting the subpattern only when the center position of the subpattern is within the selected pattern frame and for regarding the frame as blank when the center position of the subpattern is outside the selected pattern frame.

4,045,774
MODEM SHARER

Guy E. Morrison, Columbia, Mo., assignor to Skei Corporation, Columbia, Mo.

Filed Sept. 20, 1976, Ser. No. 724,613
Int. Cl.² H04B *1/38*; H04Q *5/00*; G06F *3/00*
U.S. Cl. 340—147 LP **13 Claims**

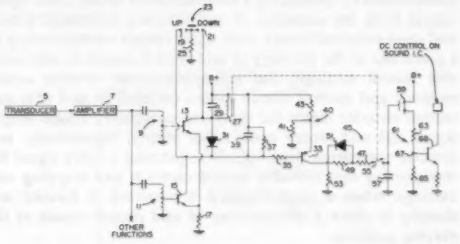


1. A modem sharer for connecting a plurality of remote terminals to a modem in a polled teleprocessing network, the modem sharer comprising: a plurality of request to send inputs for receiving signals from respective terminals when ready to transmit information; a plurality of transmitted data inputs for receiving the data to be transmitted from the respective terminals; request to send output means for associating with said modem and for transmitting a signal to said modem when a terminal provides an input signal to a request to send input; a transmitted data output for transmitting data from each of said terminals to said modem; a clear to send input for receiving a signal from said modem indicating that said modem is ready to send data, and for enabling the transmission of data from a terminal to said modem from a transmitted data input to a transmitted data output; and timer means for disenabling the transmission of data from a terminal to said modem after a predetermined time from the initiation of a signal on a request to send input.

4,045,775
CONTINUOUS DC CONTROL CIRCUIT

Daniel S. Pearce, LeRoy, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 3, 1975, Ser. No. 628,097
Int. Cl.² H04N *9/12*
U.S. Cl. 340—147 R **2 Claims**

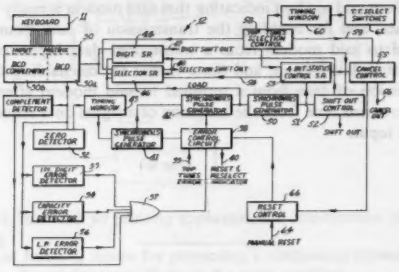


1. In a remote control for a television receiver, a continuous DC control circuit comprising:
a charge storage capacitor;
an FET having an isulated gate coupled to said charge storage capacitor and a source coupled to a voltage divider for providing an output in accordance with the potential level of said charge storage capacitor;
a charge and discharge circuit coupled to said charge storage capacitor, said circuit comprising a series connection of a first resistor, a parallel connected second resistor and a diode, and a third resistor connected to circuit ground;
a switching transistor coupled to said charge and discharge circuit, said transistor operating to provide first and second levels of potential to said charge and discharge circuit, thereby effecting different rates of charging and discharging said charge storage capacitor in accordance with said levels of applied potential;
a DC potential source; and
a control circuit coupled to said DC potential source and to said switching transistor for selectively altering the operation of said switching transistor in response to signals of a first and a second frequency.

4,045,776
ELECTRONIC PHONOGRAPH SELECTOR AND MEMORY SYSTEM

Robert W. Wheelwright, Tonawanda, and Peter E. Solender, Williamsville, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Continuation of Ser. No. 467,208, May 6, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,441
Int. Cl.[2] G11B *19/08*
U.S. Cl. 340—162 **22 Claims**



1. In an electronic phonograph selector and memory system the combination comprising: a movable record carriage for carrying a plurality of record means and selectively placing each of said record means at a playing position where it will be played, first encoder means including output detector means associated with said movable record carriage for producing a binary coded output signal corresponding to the position of said movable record carriage, selection keyboard means to be manipulated by the user for the selection of a predetermined one of the plurality of record means of said movable record carriage, second encoder means coupled to said selection keyboard means for producing a predetermined binary code signal output from the actuation of said selection keyboard means, said predetermined binary code signal output corresponding to a given one of the plurality of said record means on said movable record carriage, and non-synchronous random access memory and control circuit means coupled to said first and second encoder means for receiving said binary coded output signal and said binary code signal output, respectively, and directly comparing these signals to produce a drive signal for transporting said movable record carriage and stopping said carriage when a predetermined comparison is formed and thereby to place a selected one of said record means at the playing position.

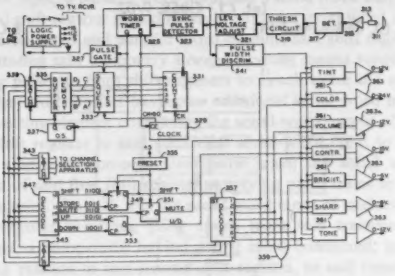
4,045,777
REMOTE CONTROL TRANSMITTER AND RECEIVER FOR USE WITH A TELEVISION RECEIVER

Eugene P. Mierzwinski, and David W. Worley, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 29, 1976, Ser. No. 671,205
Int. Cl.[2] H04B *9/00*; H04Q *9/00*
U.S. Cl. 340—168 B **22 Claims**

1. A remote control system including a remote transmitter and a receiver for remotely controlling a plurality of functions of a controlled apparatus, said transmitter comprising:
- means for selecting one of said plurality of functions to be controlled;
- means for generating pulse coded signals corresponding to selected functions;
- means for generating function level control pulses, each function level control pulse representing an increment by which the level of the selected function is to be changed; and
- means for transmitting said pulse coded signals and said function level control pulses to said receiver;

said receiver comprising:
- means for receiving transmitted pulse coded signals and function level control pulses;
- a plurality of function level setting means corresponding to said plurality of remotely controlled functions;
- means for identifying and decoding received pulse coded signals and for activating the function level setting means for the selected function; and

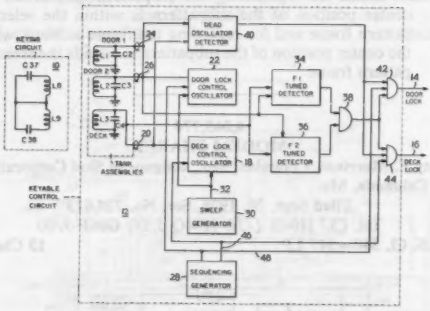


- means for identifying received function level control pulses and gating them to the function level setting means for the selected function;
- whereby the level of the selected function is changed in proportion to the number of received function level control pulses.

4,045,778
DUAL CHANNEL WIDE-BAND FREQUENCY MODULATED KEYABLE CONTROL CIRCUIT AND KEYING CIRCUIT THEREFOR

Carl E. Atkins, Montclair, and Francis A. McGuirk, Jr., Chatham, both of N.J., assignors to Wagner Electric Corporation, Parsippany, N.J.

Filed Feb. 23, 1976, Ser. No. 660,116
Int. Cl.[2] H04Q *9/10*; G08B *21/00*
U.S. Cl. 340—171 PF **12 Claims**

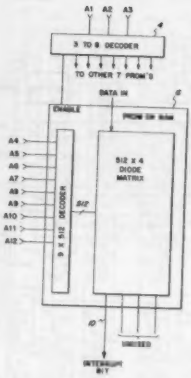


1. A keyable control circuit for use with a keying circuit having at least one resonant frequency comprising:
- a. at least one oscillator;
- b. means for connecting energy from said at least one oscillator to at least first and second spaced locations;
- c. means for generating a first signal when a keying circuit having said at least one resonant frequency is coupled to any one of said at least first or second spaced locations;
- d. means for generating a second signal when said first signal results from said keying circuit having at least one resonant frequency being coupled to said first location; and
- e. means for generating a third signal when said first signal results from said keying circuit having said at least one resonant frequency being coupled to said second location.

4,045,779
SELF-CORRECTING MEMORY CIRCUIT

Robert Eugene Markle, Rancho Palos Verdes, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1976, Ser. No. 666,825
Int. Cl.[2] G06F *11/10*; G11C *29/00*
U.S. Cl. 364—900 5 Claims



1. An improved circuit for loading into and for reading an addressed word having data from a memory having random access upon receipt of a command from a computer having a subroutine therefore, the memory having a defective bit per word wherein the improvement comprises:

a. interrupt means operative to receive the same address of the word to be loaded into the memory for recognition of a predetermined subset of stored addresses of bit defective words therein, and for generation of an error bit upon recognition of an address for transmittal to the computer for generating the command thereto to read out the words just loaded therein;

b. exclusive OR gate means operative to concurrently receive each of the bits of the given word read out from the memory and the word loaded therein at the same address for generating a respective signal upon receipt of unlike bits thereat for any given bit in the word indicating a defective bit therein that is the negation of the bit to be stored therein;

c. first gating means operative to have inputed thereto any signals generated by said exclusive OR gate means for generating a flag bit upon the receipt thereof indicating a logical complementing required of the word to be stored;

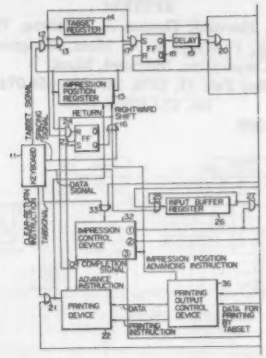
d. second gating means operative to have inputed thereto the word to be stored for outputing a signal that is a complemented representation thereof if the flag bit from said first gating means is received concurrently for storage in the memory of the word including the flag bit when present; and

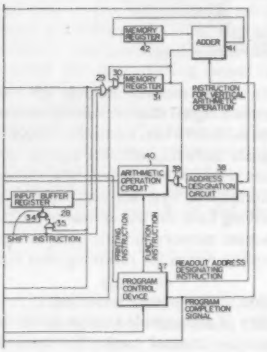
e. third gating means operative to have inputed thereto the word read from the memory for outputing a complemented representation thereof when the flag bit included in the word by said second gating means is concurrently present.

4,045,780
APPARATUS FOR ARITHMETICALLY PROCESSING BILL RECORDS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 465,725, April 30, 1974, abandoned, which is a continuation of Ser. No. 371,472, June 19, 1973, abandoned. This application July 24, 1975, Ser. No. 598,801
Int. Cl.[2] B41J *25/18*
U.S. Cl. 364—900 7 Claims





1. An apparatus for arithmetically processing bill records which comprises means for supplying numerical data; arithmetic operation means coupled to said means for supplying for arithmetically processing numerical data delivered from the means for supplying numerical data in accordance with the required type of arithmetic operation of numerical data being entered in a plurality of columns conforming to a given form of a bill; tabset signal input means for producing a plurality of tabset signals denoting boundaries between every adjacent column so as to determine a number of digits being impressed in respective columns conforming to said given form of a bill prior to supply of said numerical data; a tabset position memory register coupled to said tabset signal input means for storing a tabset signal issued from the tabset signal input means; a column signal generator coupled to said tabset position memory for giving forth a signal denoting the width of each column upon receipt of a tabset signal from said tabset position memory; first memory means coupled to said arithmetic operation means and to said column signal generator and having the same digit storing capacity as said tabset position memory and having its digit storing capacity divided in accordance with column width signals sent forth from the column signal generator for entering numerical data being recorded in the respective

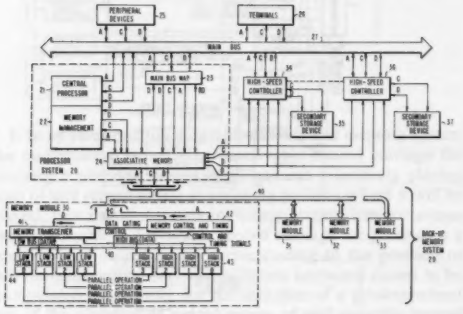
columns of a bill and results of arithmetic operation delivered from said arithmetic operation means in series in corresponding addresses of the first memory means; and printing means coupled to said first memory means for impressing numerical data stored in the first memory means in the corresponding columns of the bill.

4,045,781

MEMORY MODULE WITH SELECTABLE BYTE ADDRESSING FOR DIGITAL DATA PROCESSING SYSTEM

John V. Levy, Harvard; Thomas A. Northrup, Westford, and Robert Giggi, Peabody, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 13, 1976, Ser. No. 658,071
Int. Cl.[2] G06F 9/10
U.S. Cl. 364—200 **10 Claims**



1. A random access memory module for connection in a memory system in a digital data processing system wherein the memory system includes a bus, means for transmitting onto the bus binary signals including address signals, control signals, and data signals representing digital data, the control signals including a plurality of byte masking signals, and receiving means for receiving from the bus certain of the control signals, said random access memory module comprising:

A. data coupling means for receiving data signals from the bus,

B. addressable storage means including:

i. a plurality of addressable storage locations, and

ii. memory cycle control means for controlling memory cycles during which the digital data corresponding to the data signals from said data coupling means alters the digital data in identified ones of said addressable storage locations, the digital data at each said storage location being organized in digital bytes and each digital byte having a plurality of binary bit positions,

C. address decoding means responsive to the address signals transmitted over the bus for producing an enabling signal when the address signals identify a said storage location in said addressable storage means,

D. byte mask storage means for storing the byte masking signals received from the bus through said receiving means, each combination of byte masking signals designating a combination of digital bytes at the identified said storage location, and

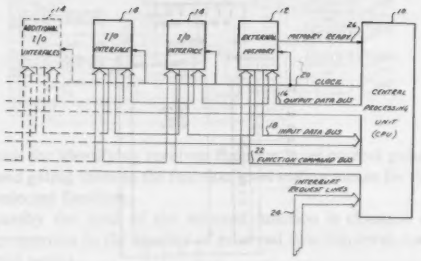
E. timing control means responsive to the enabling signal, to the contents of said byte mask storage means and to said receiving means for causing said memory cycle control means to initiate a memory cycle that alters simultaneously the binary bit positions in the digital bytes designated by the byte masking signals at the identified said storage location in accordance with data signals from said data coupling means.

4,045,782

MICROPROGRAMMED PROCESSOR SYSTEM HAVING EXTERNAL MEMORY

Terry M. Anderson, Minnetonka, and Reinhard Schumann, St. Paul, both of Minn., assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 29, 1976, Ser. No. 671,730
Int. Cl.[2] G06F 9/16, 13/00
U.S. Cl. 364—200 **13 Claims**



1. A data processing system including a central processing unit and external memory, said central processing unit comprising:

an arithmetic logic unit having first and second inputs for receiving input data and an output for carrying output data therefrom;

a first group of registers and a second group of registers each having an input connected to said arithmetic logic unit output for receiving and storing data therefrom and an output for outputting stored data;

means for selectively connecting the output of one of said registers of said first group to said first input only and for connecting the output of one of said registers of said second group with said second input only of said arithmetic logic unit;

a read only memory, said memory having a plurality of addressable word locations each storing a control instruction, and having a plurality of outputs for supplying control signals in dependence upon the addressed word location;

first means for carrying signals outputted from said arithmetic logic unit and adapted to be applied to said external memory for addressing said external memory and for storing therein data outputted from said arithmetic logic unit;

second addressing means, independent of said first means, for addressing one of said word locations of said read only memory so as to output control signals therefrom, said second addressing means having a first operating mode for incrementally addressing said word locations in a predetermined sequence, and a second actuatable operating mode for addressing a selected one of said word locations in dependence upon the data outputted from said arithmetic logic unit;

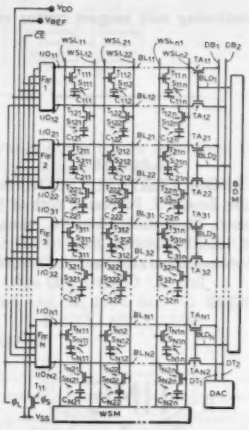
and mode control means for actuating said second addressing means from said first mode to said second mode in dependence upon the instructions represented by control signals supplied from given ones of said read only memory outputs.

4,045,783

MOS ONE TRANSISTOR CELL RAM HAVING DIVIDED AND BALANCED BIT LINES, COUPLED BY REGENERATIVE FLIP-FLOP SENSE AMPLIFIERS, AND BALANCED ACCESS CIRCUITRY

Robert Francis Harland, Stittsville, Canada, assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,066
Int. Cl.[2] G11C 11/40
U.S. Cl. 340—173 R 10 Claims



1. A dynamic MOS memory having a plurality of storage elements arranged; as a matrix, in rows and columns, each of said storage elements comprising a MOS transistor connected in series with a storage capacitor means said memory further comprising:

a. a balanced data access circuit for reading the binary status of, or writing a binary signal in, any selected storage element, said access circuit having first and second complementary data terminals;

b. a balanced data access bus, having first and second complementary data bus lines, the first and second complementary data bus lines being respectively connected to the first and second complementary data terminals of the balanced data access circuit;

c. a plurality of regenerative flip-flop balanced sense amplifiers, each of said sense amplifiers having first and second input/output nodes;

d. a plurality of bit lines, each bit line being divided into a first and a second part, the MOS transistors of the storage elements corresponding to any one bit line being connected in substantially equal number to the first and second parts of said any one bit line, the first and second parts of any one bit line, being respectively connected to the first and second input/output nodes of the regenerative flip-flop balanced sense amplifier corresponding to said any one bit line, and extending, adjacent each other, from said sense amplifier to the balanced data access bus for respective connection through a first and a second MOS access transistor to the first and second complementary data bus lines;

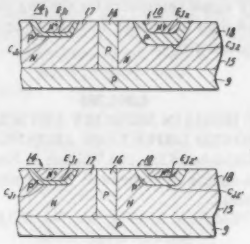
whereby, by turning ON the first and second MOS access transistors corresponding to a particular bit line, a substantially electrically balanced path is established from the first and second input/output nodes of the regenerative flip-flop balanced sense amplifier corresponding to said particular bit line to the first and second complementary data terminals of the balanced data access circuit.

4,045,784

PROGRAMMABLE READ ONLY MEMORY INTEGRATED CIRCUIT DEVICE

Hiroshi Mayumi; Yoshinobu Natsui, and Norio Kusunose, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1976, Ser. No. 648,283
Claims priority, application Japan, Jan. 10, 1975, 50-5464
Int. Cl.[2] G11C 17/00, 11/40, 7/00
U.S. Cl. 340—173 SP 3 Claims



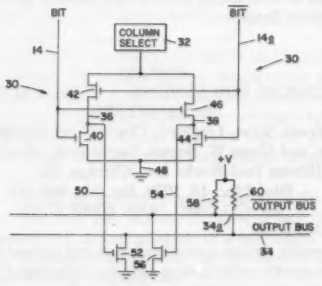
1. A read only memory integrated circuit device comprising a semiconductor substrate, a memory array including a column conductor and a first group of transistors serving as memory elements integrated on a surface of said semiconductor substrate, each of said transistors having emitter, base, and collector regions, said emitter region being connected to said column conductor, said base region being located below said emitter region and being at a floating potential, said collector region being located below said base region and forming the row of said memory array, and programming means including a second group of transistors integrated on said surface of said semiconductor substrate for applying a voltage between the emitter and collector regions of at least one selected transistor of said first group of transistors to reverse bias the emitter-base junction of said selected transistor, thereby to cause a short-circuit of said emitter-base junction, the base width of said first group of transistors exceeding that of said second group of transistors.

4,045,785

SENSE AMPLIFIER FOR STATIC MEMORY DEVICE

James William Kirkpatrick, Jr., Santa Clara, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Nov. 5, 1975, Ser. No. 629,032
Int. Cl.[2] G11C 7/06
U.S. Cl. 340—173 R 3 Claims



2. A static MOSFET memory device comprising:

an array of memory cells, each connected to one of a series of address lines and to a pair of complementary bit lines forming one of a series of bit columns;

a pair of complementary output bus lines connected through a pair of load elements to a constant voltage supply source;

pullup means for applying a constant direct current bias to the complementary bit lines of each said bit column;

a sense-amplifier for each said bit column, each said sense-amplifier comprising a pair of MOSFET signal transistors each having a source connected to ground potential and a drain connected to one of said output bus lines;

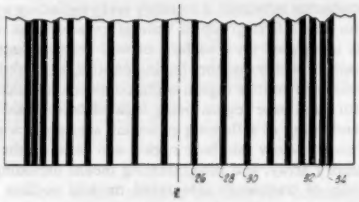
and a voltage translater section connected to said complementary bit lines of the bit column and to the gates of said MOSFET signal transistors for shifting the voltage levels on said bit lines to a lower level close to the threshold of said signal transistors.

4,045,786

MAGNETIC DOMAIN MEMORY DEVICE HAVING AN IMPROVED DRIVE COIL ARRANGEMENT

Fred S. Lee, Oklahoma City, and William F. Neu, Bethany, both of Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sept. 3, 1974, Ser. No. 503,023
Int. Cl.[2] G11C *19/08*
U.S. Cl. 340—174 TF **2 Claims**



1. A magnetic domain memory device including substrates carrying domain materials, and independently energizable drive coils positioned to encompass said substrate for generating magnetic fields whose lines of force are parallel to the surface of said magnetic domain memory device, the improvement wherein:

each of said drive coils includes a plurality of individual adjacent conductors, the spacing between the individual conductors gradually increasing as the centerline of the coils is approached from opposite edges of the coil for providing a plateau in the distribution of said magnetic fields, thus maximizing the useful area in said substrate; and

said magnetic domain memory device further including means for energizing each of said coils for generating said magnetic fields.

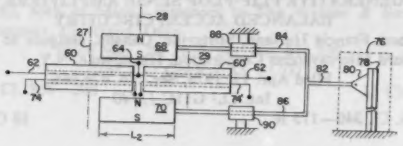
4,045,787

SENSORS FOR SENSING A PLURALITY OF PARAMETERS

Edward Frank Sidor, Lombard; Charles Carl Camillo, Western Springs, and Glenn W. Bowen, Northbrook, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 18, 1976, Ser. No. 668,093
Int. Cl.[2] G08C *19/06*; H01F *21/06*
U.S. Cl. 340—197 **2 Claims**

1. A sensing device comprising first and second inductively wound magnetic cores having different inductance vs. ambient temperature characteristics so that the inductance vs. ambient temperature characteristics of the two cores intersect at a temperature which is to be sensed, a source of voltage coupled to said inductively would cores, sensing means coupled to said cores to detect when said inductances of said cores are approximately equal, permanent magnet means positionable adjacent said cores, and a temperature responsive control means responsive to a temperature condition other than said ambient temperature for positioning said magnet means relative to said cores.

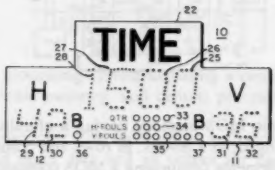


4,045,788

ALLPURPOSE PORTABLE SCOREBOARD

Joseph T. Castelli; Joseph J. Forrester, both of Pittsburgh, and Stephen Symosko, McDonald, all of Pa., assignors to Instrument Services, Inc., Bridgeville, Pa.

Filed Apr. 27, 1976, Ser. No. 680,962
Int. Cl.[2] G08B *23/00*
U.S. Cl. 340—323 R **18 Claims**



12. A portable scoring apparatus usable for a variety of sports comprising:

a first plurality of variable numerical displays for indicating selected one digit numbers;

automatic control means for operating said first plurality of variable numerical indicators as a clock which can count up and count down;

selector means connected to said automatic control means for selecting either up counting or down counting;

a second plurality of variable numerical displays for indicating selected one digit numbers;

manual control means for controlling said first and second plurality of variable numerical displays manually; and,

placard means containing descriptive material attachable to the scoreboard for adapting the scoreboard for use with a variety of sports.

4,045,789

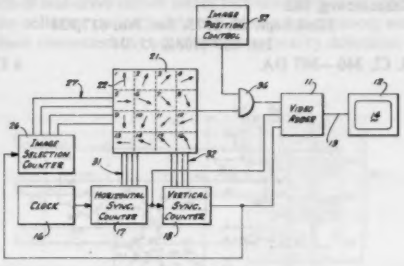
ANIMATED VIDEO IMAGE DISPLAY SYSTEM AND METHOD

Stephen D. Bristow, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Oct. 29, 1975, Ser. No. 626,664
Int. Cl.[2] H04N *7/02*; G06K *15/20*
U.S. Cl. 340—324 AD **17 Claims**

1. In a method of producing an animated image of a moving object on a video display screen, the steps of: storing digital data for a plurality of progressively different images of the object at individually addressable locations in a randomly

accessible memory applying address signals to the memory to read the data for the images out of the memory, and displaying



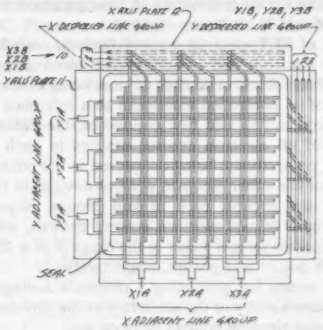
the images corresponding to the data from the memory at predetermined locations on the screen.

4,045,790

MATRIX DISCHARGE LOGIC DISPLAY SYSTEM

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 22, 1975, Ser. No. 606,986
Int. Cl.² H01J 17/48
U.S. Cl. 340—324 M **3 Claims**



1. A gas discharge display panel system comprising in combination

a gas discharge panel having an array of information display sites each information display site is a crosspoint of crossed electrode arrays, and each electrode in each of said arrays is split and multiplexable to define adjacent electrode line groupings and dispersed electrode line groupings each constructed to operate by matrix discharge logic whereby each information display site in said panel is constituted by at least a pair of positionally related cell sides, each cell side being positionally related to the other of said cell sides such that if at a given information display site one of the said related sides thereat has been erased, the erased side will be rewritten by influence of said positional relationship to a related cell side,

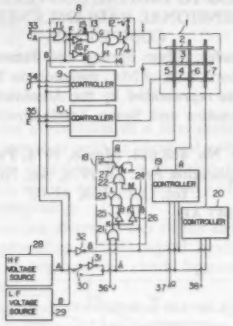
means for bulk writing information to a selected block of display sites in said panel, including means for supplying periodic sustainer potentials to said information display sites, said means for bulk writing further includes means connecting adjacent electrode lines of consecutive pairs to each other in groups and means connecting dispersed electrode lines of each pair in groups, said means for bulk writing includes address write and erase voltage pulse circuit means, and said address write voltage pulse circuit means is connected to supply address write voltage pulses to selected ones of said adjacent line groupings and address erase voltage pulses are selectively applied to all said conductor groupings.

4,045,791

APPARATUS FOR DRIVING LIQUID CRYSTAL DISPLAY DEVICE WHEREIN THE SIGNAL APPLIED THERETO IS VARIED IN ACCORDANCE WITH THE TEMPERATURE OF THE DEVICE

Masakazu Fukai, Nishinomiya; Seiichi Nagata, Sakai; Komei Asai, Hirakata, and Katsuji Hattori, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 347,631, April 4, 1973, Pat. No. 3,921,162.
This application Oct. 3, 1975, Ser. No. 619,256
Claims priority, application Japan, Apr. 6, 1972, 47-34984
Int. Cl.² G09F 9/32
U.S. Cl. 340—324 M **11 Claims**



1. Apparatus for driving a liquid crystal display device having a matrix structure including two flat substrates, a nematic liquid crystal layer and first and second groups of electrodes disposed respectively on opposite surfaces of said substrates, the electrodes of said first group, the electrodes of said second group and the liquid crystal layer interposed therebetween defining at least one electrode intersection, said apparatus comprising:

a. a plurality of first controllers, each of said first controllers having first, second and gating inputs and an output coupled to an associated electrode of said first group;

b. a plurality of second controllers, each of said second controllers having first, second and gating inputs and an output coupled to an associated electrode of said second group;

c. first and second pulse driving voltage means coupled to the first inputs of said first and second controllers respectively for applying pulse driving voltages having a predetermined frequency to selected electrodes of said first and second groups;

d. temperature detector means coupled to said liquid crystal display device for measuring the temperature adjacent said nematic liquid crystal layer, said temperature detector means changing the magnitudes of the voltages applied to all of the electrodes of said first and second groups in accordance with changes in the temperature of said liquid crystal layer;

e. first a. c. signal generating means coupled to the second inputs of said first and second controllers, said first a. c. signal generating means generating a first signal voltage having a frequency higher than that of said first and second pulse driving voltages; and

f. second a. c. signal generating means coupled to the gating inputs of said first and second controllers, said second a. c. signal generating means generating a second signal voltage having a frequency different from that of said first and second pulse driving means for controlling application of said pulse driving voltages and first a. c. signal to said first

and second groups of electrodes, dynamic scattering being produced in said liquid crystal layer at positions defined by the intersections of electrodes of said first and second groups to which pulse driving voltages have been applied and dynamic scattering being suppressed at the other electrode intersections, the temperature range wherein dynamic scattering is produced being widened as a result of the change in magnitude of the voltage applied to said electrodes as a function of the change in temperature of said liquid crystal layer.

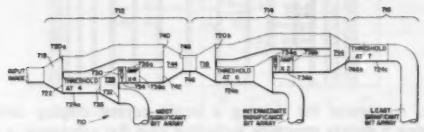
4,045,792
ANALOG TO DIGITAL CONVERTER FOR TWO-DIMENSIONAL RADIANT ENERGY ARRAY COMPUTERS

David H. Schaefer, Silver Spring, and James P. Strong, III, Upper Marlboro, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 468,614, May 8, 1974, Pat. No. 3,996,455. This application Feb. 13, 1976, Ser. No. 657,997

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 AD **8 Claims**



1. A radiant energy array analog to digital converter stage for deriving a bit array of digital radiant energy signals representative of the amplitudes of an input radiant energy analog signal array and for deriving an output radiant energy analog signal array to serve as an input to succeeding stages comprising:

means for forming a digital radiant energy array which includes;

first duplicating means for receiving said input radiant energy analog signal array and forming a pair of duplicate input signal arrays therefrom,

thresholding means responsive to one of said duplicate input signal arrays wherein an output signal array of said thresholding device is less than a predetermined threshold level when said one of said duplicate input signal arrays is more than said predetermined threshold level and wherein said output signal array of said thresholding device is more than said predetermined threshold level when said one of said duplicate input signal arrays is less than said predetermined threshold level,

second duplicating means connected to said thresholding means for receiving said thresholding means output signal array and forming a pair of duplicate output signal arrays therefrom, and

gating means connected to said second duplicating means for receiving and inverting one of said duplicate output signal arrays,

means for relatively scaling the radiant energy signal levels of the input array and said digital array so that the radiant energy signal level carried by said digital array corresponds to said threshold level, and

means for adding the signals of said relatively scaled input and digital arrays at corresponding array positions to form the output analog array.

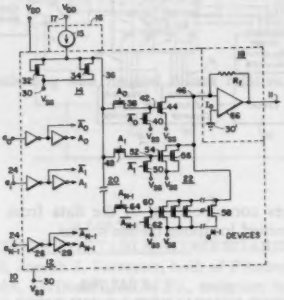
4,045,793
DIGITAL TO ANALOG CONVERTER

Jerry Dale Moench, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 29, 1975, Ser. No. 617,923

Int. Cl.[2] H03K *13/04*

U.S. Cl. 340—347 DA **4 Claims**



4. A digital to analog converter comprising:

N binary inputs for applying N signals representative of an N bit binary number to said digital to analog converter, N being an integer;

a first conductor for conducting an analog current representative of said N bit binary number;

N groups of FET electron control devices, each having a control electrode and two controlled electrodes thereof, each of said electron control devices being connected by means of its controlled electrodes to a reference voltage conductor and to said first conductor, the control electrodes of all electron control devices in each of said groups, respectively, being connected to the control electrodes of the other electron control devices in the same one of said groups, each of said groups, respectively, including 2^n of said electron control devices, wherein n has a separate integer value in the range $0 \leqq n \leqq (N-1)$ for each one of said groups, respectively;

reference means for generating a reference voltage which varies substantially at the same rate as the threshold voltage of said electron control devices; and

input means coupled to said N inputs and to said control electrodes of each of said groups of electron control devices and to said reference means for coupling said reference voltage to said control electrodes of each of said groups of electron control devices in response to said N signals.

4,045,794
ALARM INDICATING SYSTEM

Jun Ohta, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 23, 1976, Ser. No. 669,728

Claims priority, application Japan, Mar. 25, 1975, 50-35964; Oct. 9, 1975, 50-122779

Int. Cl.[2] G08B *19/00*

U.S. Cl. 340—414 **10 Claims**

1. An alarm indicating system for indicating abnormalities occurring in specific objects having a functional importance according to a predetermined order of priority, comprising:

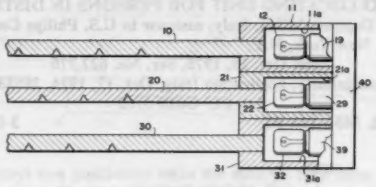
a plurality of layered indicator elements having respective alarm legends thereon and light sources connected to a power source;

a plurality of corresponding drive circuit means connected to said respective indicator elements for energizing said light sources;

a plurality of corresponding abnormality detectors con-

nected to said respective drive circuit means for sensing the occurrence of abnormalities in operation of the respective objects;

each of said drive circuit means including a transistor having its collector connected to one of said light sources and its base connected to one of said abnormality detectors;



a priority assigning means connected between each of said drive circuit means for actuating said drive circuit means according to a predetermined order or priority given thereto; and

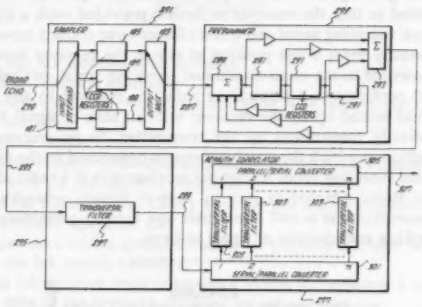
a failure checkup circuit means connected between said power source and said drive circuit means for applying individually checkup signals to said drive circuit means.

4,045,795

CHARGE-COUPLED DEVICE DATA PROCESSOR FOR AN AIRBORNE IMAGING RADAR SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Wayne E. Arens, Sierra Madre, Calif.

Filed June 23, 1975, Ser. No. 589,119
Int. Cl.[2] G01S 7/30, 9/02
U.S. Cl. 343—5 CM **15 Claims**



1. A data processor for a synthetic aperture imaging radar system having a transmitter and receiver, said processor comprising:

a demultiplexer sampling the analog output signals from said receiver, each sample being a charge proportional to the output signal voltage amplitude, and sequentially connecting the samples to a plurality of output lines;

a charge-coupled device serial shift register connected to each output line of said demultiplexer for receiving the samples of voltage amplitudes at its input and storing them as charges proportional to their respective voltage amplitude samples;

a multiplexer with its inputs connected to respective outputs of said charge-coupled device shift registers for sequentially selecting the charges from the shift registers;

means for correlating each charge sample from said multiplexer with its respective range parameter; and

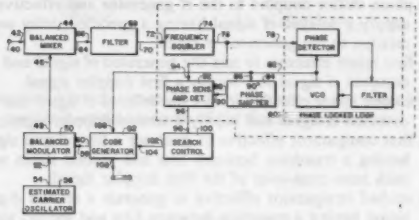
means for correlating the range identified charge samples with their respective azimuth parameter.

4,045,796

CORRELATION SYSTEM FOR PSEUDO-RANDOM NOISE SIGNALS

Arthur Jonathan Kline, Jr., Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 524,847, Nov. 18, 1974. This application Nov. 12, 1976, Ser. No. 741,443
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R **18 Claims**



1. A system for correlation of a first coded digital signal having a clock frequency with an identical coded digital signal of unknown time delay which is bi-phase modulated on a suppressed carrier signal, without recovery of the suppressed carrier signal, comprising:

means for inverting alternate bits of the first coded digital signal for providing a PN* signal having a frequency component at one-half the clock frequency of the first coded signal;

means for generating an estimated carrier signal;

means for modulating said estimated carrier signal with said PN* signal;

means for mixing said modulated signal with the identical coded signal of unknown time delay;

means for squaring said mixed signal for providing a coded signal having a clock frequency equal to the clock frequency of the first coded signal; and

means for controlling the phase of the first coded signal with said squared signal for correlating the first coded signal with the identical coded signal of unknown time delay.

4,045,797

RADAR DOPPLER FREQUENCY MEASURING APPARATUS

Mark K. Krage, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1975, Ser. No. 637,934
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—8 **2 Claims**

1. A doppler frequency measuring circuit for use with a radar system having an rf generator, a transmitter effective to transmit the rf signal toward an object and a receiver effective to detect the rf signal reflected from the object, the doppler frequency measuring circuit comprising:

A phase shifter coupled to the rf generator and effective to supply a delayed rf signal having a specified delay angle relative to the generated rf signal;

a first mixer effective to mix the generated rf signal and the detected rf signal and supply a first doppler signal;

a second mixer effective to mix the delayed rf signal and the detected rf signal and supply a second doppler signal;

logic means responsive to the first and second doppler signals for detecting zero level cross-overs of one of the first and second doppler signals, the logic means including means for preventing the detection of a zero cross-over of said one of the first or second doppler signals after detection of a zero cross-over thereof until the other one of the first and second doppler signals experiences a zero level cross-over; and

means for measuring the time duration between detected

zero level cross-overs of said one of the first and second doppler signals, the measured time duration representing the frequency of the first and second doppler signals, whereby the measurement of the frequency of the doppler signals is substantially unaffected by noise signals over a large doppler frequency bandwidth.

2. A doppler frequency measuring circuit for use with a radar system having an rf generator, a transmitter effective to transmit the rf signal toward an object and a receiver effective to detect the rf signal reflected from the object, the doppler frequency measuring circuit comprising:

a phase shifter coupled to the rf generator and effective to supply a delayed rf signal having a specified delay angle relative to the generated rf signal;

a first mixer effective to mix the generated rf signal and the detected rf signal and supply a first doppler signal;

a second mixer effective to mix the delayed rf signal and the detected rf signal and supply a second doppler signal;

a first comparator effective to generate a first digital signal having a transition between first and second states with each zero cross-over of the first doppler signal;

a second comparator effective to generate a second digital signal having a transition between first and second states with each zero cross-over of the second doppler signal;

a bi-stable multivibrator having first and second stable operating states;

a first logic gate responsive to the first and second digital signals and effective to set the bi-stable multivibrator to one of the first and second stable operating states a point in time when a selected one of the states of each of the first and second digital signals exist simultaneously;

a second logic gate responsive to the first and second digital signals and effective to reset the bi-stable multivibrator to the other one of the first and second stable operating states a point when neither of the selected one of the states of each of the first and second digital signals exits;

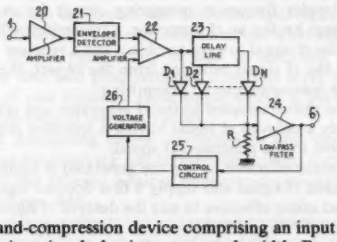
and timing means effective to measure the time duration of at least one of the stable operating states of the bi-stable multivibrator, the measured time duration representing the frequency of the first and second doppler signals, whereby the measurement of the frequency of the doppler signals is substantially unaffected by noise signals over a large doppler frequency bandwidth.

4,045,798

BAND-COMPRESSION DEVICE

Roland Carre, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 6, 1976, Ser. No. 646,745
Claims priority, application France, Jan. 10, 1975, 75.00718
Int. Cl.² G01S 7/28
U.S. Cl. 343—17.2 PC **4 Claims**



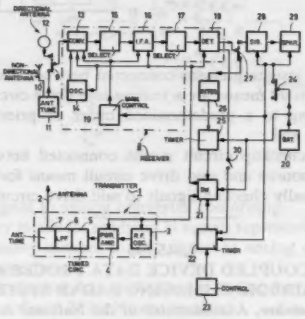
1. A band-compression device comprising an input terminal for receiving signals having a spectral width B, an output terminal for furnishing signals having a spectral width *b*, which is less than B, a variable-threshold gate of pass-band B, an amplifier circuit, a low-pass filter of pass-band *b*, and means for connecting said gate, circuit and filter in series between said input and output terminals with said gate connected to said input terminal and said filter connected to said output terminal, wherein said threshold gate comprises in series an envelope detector circuit, an amplifier-adder supplied with the output signal from a detector on one input and a reference voltage on another input, a tapped delay line connected to the output of the amplifier-adder, and an OR gate with diodes connected to the delay line tappings, the output of the OR-gate being connected to said amplifier circuit.

4,045,799

RADIO LOCATING UNIT FOR PERSONS IN DISTRESS

Fulvio Dapiran, Milan, Italy, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 15, 1975, Ser. No. 622,775
Claims priority, application Italy, Oct. 17, 1974, 28553/74
Int. Cl.² G01S 5/02
U.S. Cl. 343—113 PT **3 Claims**



1. A radio locating unit for persons in distress comprising a radio signal transmitter provided with an aerial for the transmission of a radio signal with a predetermined frequency and a receiver provided with an omni-directional aerial for the receiving of signals with said predetermined frequency, characterized in that the receiver is further provided with a directional receiving aerial and a first change-over contact movable manually from a rest position at which the receiver input is connected to the omni-directional receiving aerial, so that the unit performs as a transceiver suited to respond to any call signal picked up by the receiver with an answer signal automatically transmitted by the transmitter, to an emergency position at which the receiver input is connected to the directional receiving aerial so that the receiver acts as a radio direction finder adapted to pick up answer signals, whereby the transmitter acts as call transmitter and thereby permitting the tracking and location of signal sources.

4,045,800

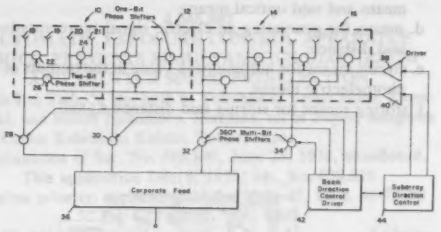
PHASE STEERED SUBARRAY ANTENNA

Raymond Tang, and Nam San Wong, both of Fullerton, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 22, 1975, Ser. No. 580,086
Int. Cl.² H01Q 3/26
U.S. Cl. 343—854 **11 Claims**

1. A phasee steered subarray antenna having an input-output junction, said antenna comprising an array of radiating elements divided equally into a plurality of subarrays, each having no less than one pair of radiating elements; means coupled between said input-output junction and each of said subarrays for dividing the energy of a signal applied to said input-output junction equally among said subarrays whereby the beam pattern of said antenna array includes a narrow main beam with grating lobes on both sides thereof; means including a multi-bit phase shifter interconnected in series with each of said subarrays for determining the direction of said narrow main beam; and means responsive to said direction of said narrow main beam including no more than a one-bit phase shifter interconnected between each pair of radiating elements

in each of said subarrays for concurrently and individually stepping the direction of the beam patterns of each of said



subarrays to a position to make the nulls on both sides thereof approximate the position of said grating lobes thereby to minimize the resultant amplitude thereof.

4,045,801

INK EJECTION HEAD FOR PRINTER

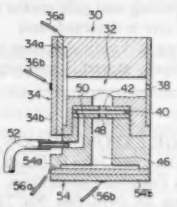
Kyuhachiro Iwasaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 26, 1976, Ser. No. 690,130

Claims priority, application Japan, June 3, 1975, 50-66895

Int. Cl.[2] G01D *15/16*

U.S. Cl. 346—140 R **8 Claims**



1. An ink ejection head defining:
an ink ejection chamber;
an ink ejection orifice communicating with the ink ejection chamber;
an ink supply chamber;
an ink supply orifice communicating the ink supply chamber with the ink ejection chamber;
an ink inlet communicating with the ink supply chamber;
a pressure chamber; and
a pressure orifice communicating the pressure chamber with the ink supply chamber;
the ink ejection head comprising means for reducing a volume of the pressure chamber for ink ejection.

4,045,802

INK EJECTION PRINTING APPARATUS COMPRISING AUTOMATICALLY ACTUATED EJECTION ORIFICE CAP

Takao Fukazawa; Takuro Isayama; Kyuhachiro Iwasaki, and Hiromichi Komai, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

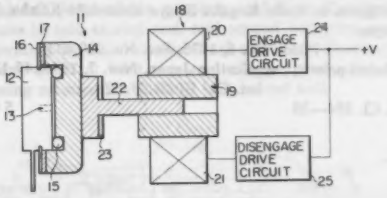
Filed July 27, 1976, Ser. No. 709,021

Claims priority, application Japan, July 29, 1975, 50-92369; Nov. 13, 1975, 50-136483

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 R **15 Claims**

1. An ink ejection printing apparatus comprising:
an ink ejection head formed with an ink ejection orifice;
a cap movable between a disengaged position spaced from the ink ejection head and an engaged position in engagement with the ink ejection head hermetically sealing the ink ejection orifice;
first biasing means urging the cap to the engaged position; and



second biasing means to move the cap to the disengaged position against a force of the first biasing means.

4,045,803

PHOTOCOMPOSING APPARATUS

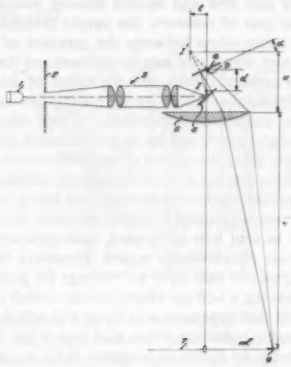
Howard Raymond Baylis, East Grinstead, and Roger Alan Edwards, Crawley Down, both of England, assignors to The Monotype Corporation Limited, Salfords, England

Filed Aug. 1, 1975, Ser. No. 600,960

Claims priority, application United Kingdom, Aug. 6, 1974, 34656/74

Int. Cl.[2] B41B *13/00*

U.S. Cl. 354—5 **9 Claims**



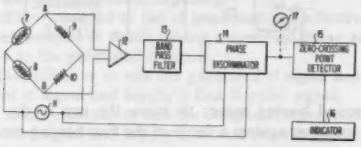
1. Photocomposing apparatus comprising a projection system for projecting optical images of characters selected from a matrix of master characters onto a photosensitive recording member, wherein the projection system includes: a mirror which is rotatable to displace projected optical images with respect to the recording member; a wide angle lens for focussing the projected optical images onto a substantially flat image recording plane coincident with the recording member; means for illuminating the character matrix and producing a light beam bearing images of the selected characters; and means for focussing said light beam to produce a first fixed image of the selected characters which provides, by the action of said rotatable mirror, a second image forming an object for the wide-angle lens which is selectively positionable in a substantially flat object plane.

4,045,804

FOCUS DETECTING DEVICE

Hideomi Takeda, and Kazuo Kikuchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,433
Claims priority, application Japan, Nov. 7, 1974, 49-128384
Int. Cl.[2] G02B 23/02
U.S. Cl. 354—25 5 Claims



1. In an apparatus of the type having a focusing lens movable relative to a focal plane F_0 for focusing light from a scene onto said focal plane and a system for developing an electrical signal indicative of an in-focus condition, the improvement comprising, first light sensing means positioned to sense light, after passing through said lens, in a plane which is positioned optically close to said lens relative to said focal plane F_0, second light sensing means positioned to sense light after passing through said lens, in a plane which is positioned optically further from said lens relative to said focal plane F_0, and a.c. circuit means, including said first and second light sensing means, for developing a.c. signal having an amplitude dependent upon the diferent amount of light sensed by said first and second sensing means and a phase dependent upon which one of said sensing means senses the greater amount of light, said a.c. circuit means comprising, a bridge network having four legs, said first and second sensing means being the first and second legs of said bridge circuit, and a pair of resistors being the third and fourth legs of said bridge circuit, means for applying an input a.c. voltage of a predetermined frequency between the junction of said first and second sensing means and the junction of said pair of resistors, the output terminals of said bridge circuit being taken between the junction of said first sensing means and one of said pair of resistors and the junction of said second sensing means and the other of said pair of resistors, a differential amplifier means having first and second input terminals, connected respectively to said output terminals of said bridge circuit, and an output terminal, and a bandpass filter connected to the output of said differential amplifier, said bandpass filter having a center frequency substantially the same as said predetermined frequency and being adapted to reject noise frequency caused by relatively slow movement of said apparatus as said lens is focused, said apparatus further comprising phase discriminator means responsive to said developed a.c. signal and said input a.c. voltage for generating an output signal having a voltage characteristic which is substantially zero when said apparatus is in focus and which increases rapidly at opposite polarities when said lens is too far or too close, respectively, to F_0 for an accurate in-focus condition.

4,045,805

AUTOMATIC FOCUSING APPARATUS

Mitsuru Saito, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1975, Ser. No. 641,040
Claims priority, application Japan, Dec. 19, 1974, 49-147258
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—25 13 Claims

1. Automatic focusing apparatus for an optical system which forms an image of an object on an image plane, comprising:

a. photoelectric means;

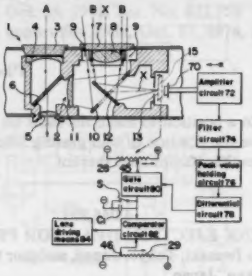
b. optical means for forming substantially the same image as that focused by said optical system on said image plane, said photoelectric means being so constructed to generate output signal continuously in response to brightness distribution in the image formed thereon by said optical means;

c. means for changing distance between said photoelectric means and said optical means;

d. means for generating an electric signal representative of said distance;

e. circuit means for holding peak value in the outputs of said photoelectric means;

f. storing means for storing said distance signal;



g. gate means for allowing said distance signal to enter said storing means only when said gate means is open;

h. first comparator means for comparing peak value held by said circuit means with output signal of said photoelectric means and for opening said gate means when a peak value larger than held one is detected; and

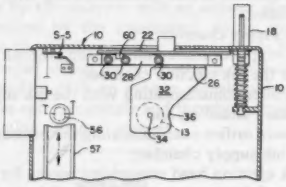
i. means for adjusting said optical system in accordance with distance signal finally stored in said storing means.

4,045,806

EXTENDED RANGE EXPOSURE CONTROL SYSTEM

Seymour Ellin, Brookline, and John R. Sharp, Squantum, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 23, 1976, Ser. No. 716,362
Int. Cl.[2] G03B 7/00, 9/04
U.S. Cl. 354—37 8 Claims



7. In an exposure control system for photographic cameras having a shutter housing with a front wall mounting an objective lens, an externally accessible aperture plate mechanism slideable within the housing between a first position providing a reduced diaphragm stop and a second position providing a maximum relative lens aperture thereby providing an identical exposure parameter respectively for high and low speed films under the same scene light levels, a shutter, and a light sensitive circuit means having an RC timing network including a photoconductive cell exposed through the front housing wall to vary the operating speed of the shutter in accordance with the light level of the scene to be photographed, the improvement comprising:

means for mounting said aperture plate mechanism for movement to a third position also providing said maximum relative lens aperture; and

a switch engageable by said aperture plate mechanism in said third position to shift the light level exposure sensitivity of said circuit for proper exposure of said high-speed film at

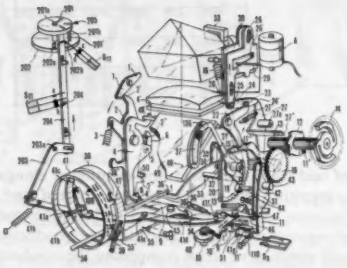
said maximum relative lens aperture under relatively dim levels of scene illumination.

4,045,807

AUTOMATIC EXPOSURE CONTROL APPARATUS WHICH PREVENTS SIMULTANEOUS DIAPHRAGM AND SHUTTER SPEED PRESELECTION

Fumio Ito; Tadashi Ito, both of Yokohama; Yasuo Isobe, Kawasaki, and Soichi Nakamoto, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 482,895, June 25, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 638,029
Claims priority, application Japan, June 27, 1973, 48-72398
Int. Cl.² G03B *7/08, 9/00*
U.S. Cl. 354—38 **6 Claims**



1. An exposure control apparatus for a camera adapted for automatic exposure by means of either a shutter speed preselection system or a diaphragm preselection system comprising:

a shutter speed setting member having a single automatic setting adjustment position and a plurality of manual setting adjustment positions and including a shutter speed control means being connected with said setting member;

a diaphragm setting member provided apart from said shutter speed setting member having a single automatic setting adjustment position and a plurality of manual setting adjustment positions, and including a diaphragm control means being connected with said setting member;

a first interference member fixed to said shutter speed setting member and rotatable to a predetermined adjustment position only when said diaphragm member is not in an automatic adjustment position; and

a second interference member mounted for sliding along a guide and capable of entering the path of rotation of said first interference member in association with the movement of a diaphragm setting member to its automatic adjustment position only when said shutter speed setting member is not in an automatic adjustment position, one of said two interference members interfering with the movement of the other member to said predetermined adjustment position and preventing said movement when said predetermined adjustment position is initially occupied by the former interference member.

4,045,808

CAMERA MOUNTED FLASH EXTENDER AND POWER PACK THEREFOR

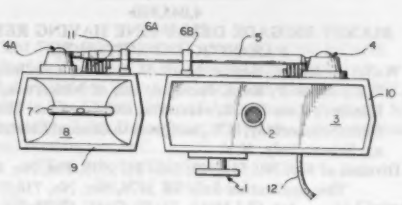
Dwayne L. King, 825 DeLucchi Lane No. 311, Reno, Nev. 89502

Continuation-in-part of Ser. No. 462,418, April 19, 1974, Pat. No. 3,893,145. This application June 2, 1975, Ser. No. 583,187
Int. Cl.² G03B *15/02*
U.S. Cl. 354—126 **5 Claims**

2. A photographic apparatus including in combination a telescopic extender means, coupling means for coupling a first end of said extender to a camera and flash illumination means coupled to a second end of said extender, the improvement comprising:

first ball joint means connecting said coupling means to said first end of said extender for pivotal movement about at least two mutually perpendicular axes passing substantially through said first end;

second ball joint means coupling said flash illumination means to said second end, said second ball joint means providing pivotal movement of said flash illumination means about at least two mutually perpendicular axes passing substantially through said second end;



said coupling means including a housing means connected between said camera and said first ball joint means for containing at least a power source for said flash illumination means;

first catch means disposed on said housing means for snapping engagement with said telescopic extender in a predetermined position of said extender; and

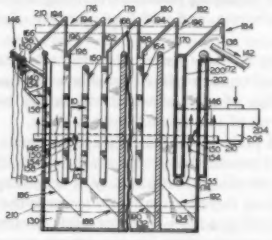
second catch means disposed on said flash illumination means for snapping engagement with said extender in a predetermined position of said flash illumination means.

4,045,809

PHOTOGRAPHIC FILM DEVELOPING APPARATUS

Richard D. Landers, Salem, Oreg., assignor to Kreonite, Inc., Wichita, Kans.

Filed July 2, 1974, Ser. No. 485,209
Int. Cl.² G03D *3/08*
U.S. Cl. 354—322 **6 Claims**



1. Photographic film processing apparatus, comprising:

a. means defining a series of adjacent, horizontally aligned chambers open at their upper ends, respectively, each of said chambers being adapted to contain a selected film-treating fluid agent;

b. a plurality of first unsymmetrical angular plates mounted at the bottoms of said chambers, respectively;

c. a plurality of second unsymmetrical angular plates mounted at the tops of said chambers in straddling relation across successive chambers, respectively;

d. at least one magnetic carriage arranged in one of said chambers;

e. releasable grip means mounted on said carriage for releasably gripping one end of a length of film, whereby the film is maintained in trailing relation to the carriage;

f. a permanent magnet arranged externally of said chambers, said permanent magnet being a horizontal bar magnet extending the length of said chambers; and

g. means for continuously displacing said permanent magnet

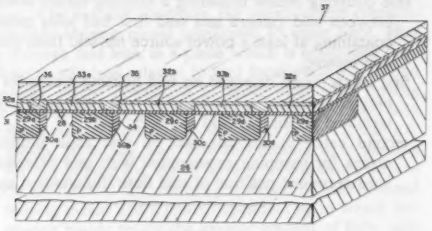
means vertically relative to said chambers, said second angular plates being so arranged that when the carriage is displaced upwardly toward the top of one chamber, it is displaced by the associated angular plate from the top of one chamber toward the top of the next successive chamber, thereby to effect transport of the carriage in succession through the chambers.

4,045,810

BUCKET-BRIGADE DELAY LINE HAVING REDUCED PARASITIC CAPACITANCES

Walter J. Butler, Scotia; Mark B. Barron, Camillus, both of N.Y.; Bruno F. Kurz, deceased, late of Niskayuna, N.Y., by Elizabeth Kurz-Beerli, executrix, also known as Elisabeth H. Kurz, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 552,940, Feb. 25, 1975, Pat. No. 4,002,513.
This application July 30, 1976, Ser. No. 710,021
Int. Cl.[2] H01L *29/78;* **G11C** *19/28*
U.S. Cl. 357—24 **3 Claims**



1. An MOS bucket-brigade delay line comprising

a semiconductor substrate of a first conductivity type,

a first plurality of laterally spaced apart regions of a second conductivity type, extending from one major surface of said substrate a first distance thereinto,

a layer of insulating material overlying said major surface of said substrate, and said first plurality of spaced apart regions,

a plurality laterally spaced apart refractory metal electrodes disposed on the surface of said layer of insulating material, one edge of each of which essentially overlaps one and only one of said spaced apart regions,

a second plurality of laterally spaced apart regions of said second conductivity type, each of which is contiguous with one of said first plurality of spaced apart regions and extending therefrom laterally towards the essentially non-overlapping edge of one of said refractory metal electrodes and extending into said substrate a distance less than said first distance.

4,045,811

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING AN ARRAY OF INSULATED GATE FIELD EFFECT TRANSISTORS

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,833
Int. Cl.[2] H01L *27/02, 27/10*
U.S. Cl. 357—41 **6 Claims**

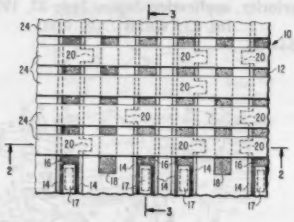
1. A monolithic integrated semiconductor device formed in a body of semiconductive material, initially of one type conductivity and having a surface, comprising:

a plurality of parallel, elongated regions of conductivity type opposite to that of said body in said body adjacent to said surface, said regions being arranged in pairs,

a lesser plurality of regions of said opposite type conductivity, each member of said lesser plurality of regions being disposed between the regions of a separate pair of the first-mentioned regions of opposite type conductivity,

insulating material on said surface over the spaces between said first-mentioned and second-mentioned regions of opposite type conductivity,

a plurality of conductive strips on said insulating material and extending transversely of said elongated regions of opposite type conductivity whereby a plurality of MOS transistors are defined at a plurality of locations in said semiconductor device, said second-mentioned regions of opposite type conductivity comprising the drain regions



of said transistors, said first-mentioned elongated regions comprising the source regions thereof and the spaces between said firstmentioned and said second-mentioned elongated regions of opposite type conductivity beneath said conductive strips comprising the conduction channel zones of said MOS transistors, and

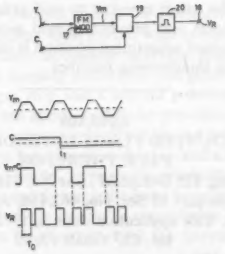
means in said body in selected ones of said conduction channel zones for increasing the threshold potential of said selected ones of said conduction channel zones relative to the threshold potentials of unselected ones of said conduction channel zones.

4,045,812

COLOR TELEVISION RECORDING SYSTEM EMPLOYING FREQUENCY MODULATION AND PULSE WIDTH MODULATION

Leonardus Adrianus Johannes Verhoeven; Maarten Rutger De Haan, and Peter Johannes Michiel Janssen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 466,626, May 3, 1974, Pat. No. 3,982,272.
This application Dec. 19, 1975, Ser. No. 642,293
Claims priority, application Netherlands, Feb. 13, 1974, 7401934
Int. Cl.[2] H04N *9/36, 5/79*
U.S. Cl. 358—4 **1 Claim**



1. A record carrier on which a color television signal having luminance and chrominance information is recorded with a low frequency chrominance signal having alternately from line to line two different single color components and a first carrier frequency modulated by the luminance information, said frequency modulated carrier being pulse-width modulated by the

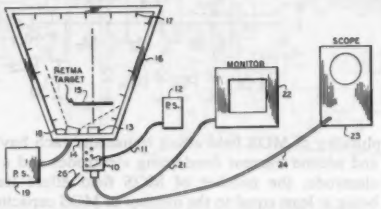
chrominance signal, said carrier comprising a pattern of blocks alternating with areas disposed along a track direction on said carrier, the blocks having a constant length in the track direction and representing the rising and falling edges of the frequency and pulse-width modulated first carrier.

4,045,813

METHOD OF OPERATING VIDEO CAMERAS AND LIGHTS UNDERWATER

Richard F. Jones, Santa Barbara, Calif., assignor to General Aquadyne, Inc., Santa Barbara, Calif.

Filed July 10, 1975, Ser. No. 594,789
Int. Cl.² H04N 7/18
U.S. Cl. 358—99 **7 Claims**



1. The method of operating a television camera and a light underwater wherein the light is adjacent to the camera and illuminates objects being imaged by the camera for the purpose of reducing reflections from foreground particles and dirt comprising:

a. adjusting the camera for clear image performance up to the point of signal clipping by exposure of the camera to a selected intensity of light of approximately the maximum expected to be encountered underwater;

b. adjusting the sensitivity of the camera within a range of five to ten times normal;

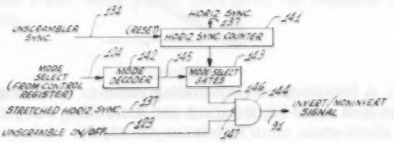
c. and utilizing a light source in the range of light equivalent to that delivered by reflectorized incandescent bulbs in the range of five to twenty-five watts.

4,045,814

METHOD AND APPARATUS FOR SCRAMBLING AND UNSCRAMBLING COMMUNICATION SIGNALS

Albert F. Hartung, Woodland Hills; Frank W. Lehan, Santa Barbara; Charles T. Barooshian, Pacific Palisades, and Edward J. Zacharski, Malibu, all of Calif., assignors to System Development Corporation, Santa Monica, Calif.

Division of Ser. No. 388,439, Aug. 15, 1973, Pat. No. 3,919,462.
This application Sept. 2, 1975, Ser. No. 609,572
Int. Cl.² H04N 1/44
U.S. Cl. 358—124 **7 Claims**



1. For use with receivers in a subscription television system, a method of unscrambling television video signals scrambled by the inversion of portions corresponding to preselected lines in a television picture, comprising the steps of:

counting portions of the video signals corresponding to lines of the television picture in a counter having a plurality of digits;

inverting the video signals only when a particular digit of the counter is in a particular state;

receiving unscrambler mode selection signals encoded from time to time in vertical blanking intervals of the video signals; and

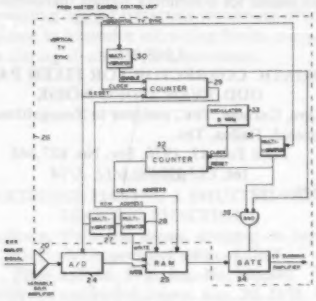
varying the selection of the particular digit from the counter in accordance with the received unscrambler mode selection signals, whereby selection of a digit of low significance in the counter results in frequency inversion of the video signals and selection of a digit of high significance in the counter results in less frequency inversion.

4,045,815

SYSTEM FOR COMBINING ANALOG AND IMAGE SIGNALS INTO A STANDARD VIDEO FORMAT

James M. Griffith, and Walter L. Henry, both of Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Feb. 4, 1976, Ser. No. 655,262
Int. Cl.² H04N 5/22
U.S. Cl. 358—183 **11 Claims**



1. A system for combining at least one analog signal with video signals comprising:

an analog-to-digital converter having an analog signal input means and an enabling signal input means;

a random access memory having a data input means coupled to said analog-to-digital for receiving its digital output, said random access memory having a write input means, a row address input means and a column address input means;

a controlled gate circuit means having its data signal input means coupled to said random access memory for receiving its output, said gate circuit means having a control signal input means;

a source of vertical and horizontal sync signals;

first multivibrator means, second multivibrator means and third multivibrator means;

means coupling vertical sync signals from said source to said enabling signal input means of said analog-to-digital converter for enabling same upon occurrence of each vertical sync signal;

means coupling vertical sync signals from said source to an input of said first multivibrator means, said write input means of said random access memory being coupled to said first multivibrator means;

a first counter means having an enable input means, a clock input means and a reset input means, means for coupling vertical sync signals from said source to said reset input of said first counter means, means for coupling horizontal sync signals from said source to said clock input means of said first counter means, and means for coupling said enable input means of said first counter means to an output of said second multivibrator means, said second multivibrator means having its input means coupled to said source for receiving horizontal sync signals therefrom, and said row address input means of said random access

memory being coupled to said first counter means for receiving its output signals;

oscillator means;

a second counter means having a clock input means coupled to said oscillator means for receiving output signals therefrom and having reset input means coupled to said third multivibrator means for receiving output signals therefrom, said third multivibrator means having its input means coupled to said source for receiving vertical sync signals therefrom, and said column address input means of said random access memory being coupled to said second counter means for receiving its output signals;

logic circuit means having a first input coupled to said third multivibrator means for receiving its output signals and having a second input coupled to said second multivibrator means for receiving its output signals, said logic circuit having its output coupled to said control signal input means of said gate circuit means for enabling said gate circuit;

an additional source supplying video signals; and

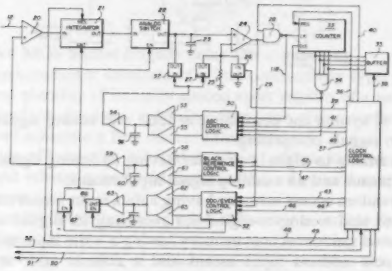
means coupled to said additional source and to said gate circuit means for combining signals therefrom.

4,045,816

AUTOMATIC CORRECTOR FOR FIXED PATTERN ODD/EVEN VIDEO NOISE

Ellis K. Cave, Garland, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Feb. 12, 1976, Ser. No. 657,646
Int. Cl.² H04N *3/12, 3/14*
U.S. Cl. 358—212 **13 Claims**



1. In a video signal conditioning system for a self-scanning array of photosensor cells including a pulse width modulating means, the combination which comprises:

a. charge accumulation means responsive to video pulses issuing from said pulse width modulating means for storing incremental charges to form a charge sum reflecting the average of differences between responses of adjacent photosensor cells of said array; and

b. pulse width correction means in electrical communication with said charge accumulation means for applying said charge sum to said pulse width modulating means to alter the pulse width of alternate ones of said video pulses.

4,045,817

SEMICONDUCTOR OPTICAL IMAGE SENSING DEVICE

Hirokuni Nakatani; Toru Takamura, both of Takatsuki, and Susumu Hashimoto, Katano, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Feb. 12, 1976, Ser. No. 657,697
Claims priority, application Japan, Feb. 20, 1975, 50-21633
Int. Cl.² H04N *3/14;* H03K *3/42;* H01J *39/12;* H03K *23/12*
U.S. Cl. 358—213 **7 Claims**

1. A semiconductor optical image sensing device comprising:

a power supply;

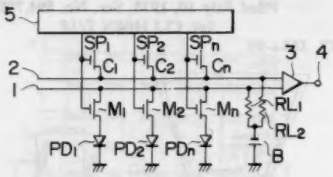
first and second load means;

a differential amplifier;

first and second output lines connected to said differential amplifier and to one terminal of said power supply through said first and second load means, respectively;

a plurality of MOS capacitors each having a current conducting electrode and a control electrode, each current conducting electrode of said MOS capacitors being connected to said second output line;

a plurality of photo-sensing devices, the number of photo-sensing diodes being at least equal to the number of MOS capacitors; and



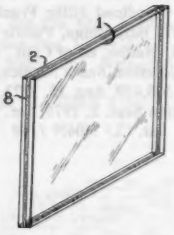
a plurality of MOS field effect transistors each having first and second current conducting electrodes and a control electrode, the number of MOS field effect transistors being at least equal to the number of MOS capacitors, said first current conducting electrode of each of said MOS field effect transistors being connected to said first output line, said second current conducting electrode of each of said MOS field effect transistors being connected to the other terminal of said power supply through a corresponding one of said photo-sensing devices respectively and the control electrode of each of said MOS field effect transistors being connected to the control electrode of the corresponding one of said MOS capacitors.

4,045,818

METHOD AND DEVICE FOR CONTROLLING RADIATION

George M. Wilhelm, 236 Stoneycliff Road, Centerville, Mass. 02632

Filed Nov. 28, 1975, Ser. No. 635,786
Int. Cl.² H04N *5/65*
U.S. Cl. 358—245 **13 Claims**



1. A lens device for controlling radiation emanating from a television receiving apparatus and controlling the production of electrostatic units without any distortion of the television picture comprising:

a. a first transparent plate;

b. a second transparent plate juxtaposed against the first transparent plate;

c. a composition consisting essentially of a thin transparent mineral oil film between the first and second transparent plates;

d. a means for sealing the edges between the first and second transparent plates whereby the mineral oil is sealed between the plates; and

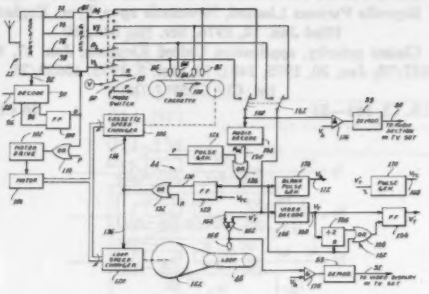
e. a means for attaching the lens device to the viewing surface of the television receiving apparatus.

4,045,819

VIDEO RECORDER AND PLAYBACK APPARATUS

Peter C. Goldmark, Stamford, Conn., assignor to Goldmark Communications Corporation, Stamford, Conn.

Division of Ser. No. 297,180, Oct. 13, 1972, Pat. No. 3,938,189.
This application Nov. 28, 1975, Ser. No. 636,316
Int. Cl.[2] H04N 5/79
U.S. Cl. 360—8 11 Claims



1. An apparatus for playing back video still pcitures with associated audio for display and sound projection comprising
program storing means for storing video frames and associated audio frames;
a magnetic video frame storing loop having a track sized to store a still picture video frame;
means for recording on and playing back a video frame stored on said loop;
means for producing from the program storing means audio frame signals representative of audio associated with a video frame stored on said loop;
means for producing an audio end signal representative of the end of an audio frame associated with said stored video frame; and
means actuated by said audio end signal for transferring a video frame from said program storing means on said loop for playback with associated audio frame signals.

3. A method for transmitting, receiving and displaying still picture video programs comprising the steps of
transmitting a composite signal formed of a pluralitu of video frames and audio frames respectively associated with the video frames;
recording the composite signal on a magnetic medium;
playing back the recorded magnetic medium to generate audio frames and associated video frames therefrom;
transferring video frames being played back from the magnetic medium for storage on a magnetic loop; and
playing back the video frame stored on said loop for simultaneous display thereof with the projection of the associated audio frame being played back from the magnetic medium.

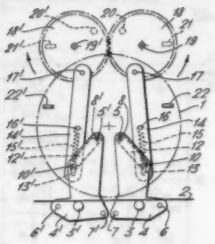
4,045,820

DEVICE FOR POSITIONING AND GUIDING A MAGNETIC TAPE AROUND THE DRUM OF A ROTARY HEAD ASSEMBLY

Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed July 29, 1975, Ser. No. 600,091
Claims priority, application France, Aug. 5, 1974, 74.27182
Int. Cl.[2] G11B 15/66
U.S. Cl. 360—85 8 Claims

1. In apparatus for positioning and guiding magnetic tape around the drum of a rotary head assembly in a recording and/or reproducing mechanism having at least two guide fingers for guiding the magnetic tape and mounted for movement between a retracted position where the guide fingers engage the magnetic tape in a self-contained cartridge, and an advanced position where the guide fingers dispose the tape along a predetermined helical path on the drum surface, the improvement comprising
self-locking means for holding the guide fingers in the advanced position against normal retracting forces exerted on said fingers by the tape moving thereover, and means for permitting limited retracting movement of said fingers in response to excessive retracting forces exerted on said fingers during abnormal tape movement.

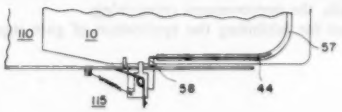


4,045,821

TAPE CARTRIDGE HAVING A SHUTTER WITH SELF LOCKING FUNCTION

Hiroshi Fujikura, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,398
Claims priority, application Japan, Aug. 29, 1975, 50-104075
Int. Cl.[2] G11B 23/04
U.S. Cl. 360—132 15 Claims



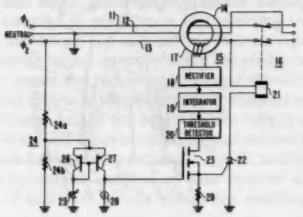
1. A tape cartridge comprising a hollow container with a given exterior outline and having a tape receiving cavity for storing a tape therein, a peripheral wall of the container having at least one aperture means for receiving an external tape operating member for the tape in the container, a shutter guide extending across said aperture means along edges of said peripheral wall, a shutter slidable in said shutter guide along said peripheral wall between a closed position wherein said aperture means is covered and an opened position wherein said aperture means is exposed;
the improvement being characterized by:
a flexible bifurcated member attached to an outwardly facing surface of said shutter such that its bifurcated ends form free ends and having a longitudinal axis parallel to the direction of sliding movement of said shutter;
bifurcated member guide means in said peripheral wall for guiding said bifurcated member along the edges of said peripheral wall as said shutter slides;
outwardly projecting pawls disposed at the free ends of said bifurcated member and projecting towards said bifurcated member guide means; and
said bifurcated member guide means having recesses for engagingly receiving said pawls to inhibit movement of said shutter towards said opened position when said shutter is in said closed position.

4,045,822

GROUND FAULT INTERRUPTER APPARATUS

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 3, 1976, Ser. No. 682,456
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—45 **6 Claims**



1. In a ground fault interrupter apparatus for use with a plurality of a-c line conductors, connecting an a-c generator to a load, which apparatus has an electromechanical relay switch for interrupting flow through said a-c line conductors responsive to application of an actuating current; an actuating signal supply dependent on potential between a pair of said a-c line conductors; a controlled rectifier means having a controlled conduction path which selectively connects said actuating signal supply to said relay switch for causing said actuating current to flow and having a gate electrode; differential current sensing means for providing a transformed imbalance current when currents flowing from the generator to the load differ from currents returning from the load to the generator; means for rectifying said imbalance current to obtain a rectified signal; means for integrating said rectified signal to obtain an integrated signal; and threshold detecting means for detecting when said integrated signal exceeds a threshold value to provide a gate signal to the gate electrode of said controlled rectifier means to initiate conduction in its controlled conduction path, the improvement comprising:

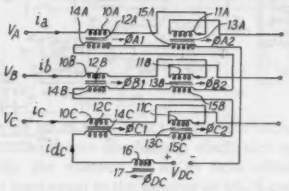
means for inhibiting the application of gate signal to said controlled rectifier means during the rapidly collapsing portions of the actuating signal.

4,045,823

CURRENT LIMITING DEVICES FOR ALTERNATING CURRENT SYSTEMS

Kenneth Charles Parton, Sutton Coldfield, England, assignor to Reyrolle Parsons Limited, Newcastle upon Tyne, England

Filed Jan. 14, 1976, Ser. No. 648,980
Claims priority, application United Kingdom, Jan. 17, 1975, 2027/75; Jan. 20, 1975, 2481/75; Oct. 3, 1975, 40629/75
Int. Cl.[2] G05F *1/04*
U.S. Cl. 361—58 **16 Claims**



1. A current-limiting device for an alternating current system comprising for each phase of the system at least two iron-cored saturable reactors, each reactor having an alternating current winding and a direct current super-conducting bias winding, the bias winding being capable of maintaining the core of the reactor saturated under full load alternating current conditions, the alternating current windings in each phase being so arranged and connected that under full load conditions a change in the level of saturation in any one reactor core relative to the bias level due to the bias winding alone is accompanied by a compensating change in saturation level in another core or cores, current limiting occurring when on each half-cycle one or other of the cores is forced out of saturation.

DESIGN PATENTS

GRANTED AUGUST 30, 1976

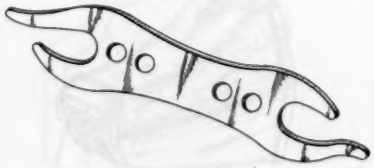
ERRATA

For CLASS	See PATENT NO.
014–011	245,627
014–093	245,628
011–154	245,643

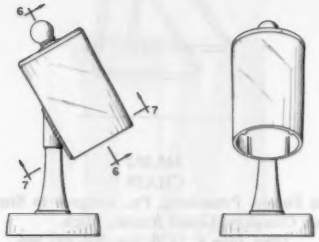
245,546
DIAPER COVER
Yoshizo Okuda, 3-16 Gakuenkita 1-chome, Nara, Nara, Japan
Filed Feb. 20, 1976, Ser. No. 659,711
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—10

245,547
BRASSIERE
Madeline Surace, New York, N.Y., assignor to Qismet, Ltd., New York, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,893
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

245,548
TATTING SHUTTLE
Lael Morgan, P.O. Box 4-EEE, Anchorage, Alaska 99509
Filed Dec. 2, 1975, Ser. No. 636,976
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D3—19 A



245,549
CUP DISPENSER
Jerry A. Brown, 4014 San Jose Drive, Greenwood, Ind. 46142
Filed Aug. 6, 1976, Ser. No. 712,243
Term of patent 14 years
Int. Cl. D6—*04*; D9—*99*
U.S. Cl. D6—25



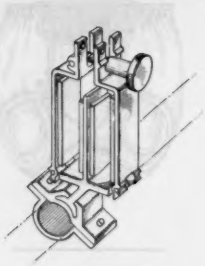
245,550
CHAIR
Robert De Fuccio, Pennsburg, Pa., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed June 4, 1976, Ser. No. 693,089
The portion of the term of this patent subsequent to Aug. 30, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

245,551
CHAIR
Robert De Fuccio, Pennsburg, Pa., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed June 4, 1976, Ser. No. 692,965
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

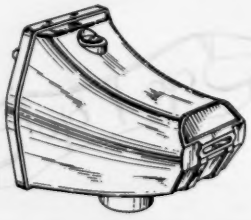
245,552
CHAIR
Robert De Fuccio, Pennsburg, Pa., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed June 4, 1976, Ser. No. 692,966
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

245,553
CHAIR
Robert De Fuccio, Pennsburg, Pa., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed June 4, 1976, Ser. No. 693,088
The portion of the term of this patent subsequent to Aug. 30, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

245,554
SKI CLAMP
Uri Surkin, 5843 N. Ranchito, Van Nuys, Calif. 91401, and Ludwig Surkin, 6501 Drexel Ave., Los Angeles, Calif. 90048
Filed Nov. 24, 1976, Ser. No. 744,767
Term of patent 14 years
Int. Cl. D6—*99*; D8—*99*
U.S. Cl. D6—85

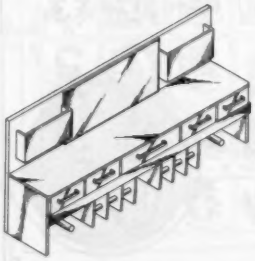


245,555
DISPENSER FOR HOT SHAVING LATHER
Samuel L. McNair, Kansas City, Mo., assignor to Dazey Products Company, Kansas City, Mo.
Filed Feb. 27, 1976, Ser. No. 662,032
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D6—95

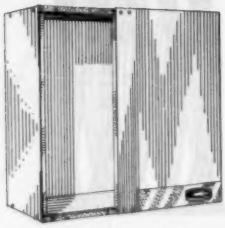


245,556
NOZZLE HOLDER FOR GARDEN HOSE
Jeanne M. Meyer, 833 S. Ivy Drive, Lake Arrowhead, Calif. 92352
Filed Nov. 3, 1975, Ser. No. 628,052
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D6—112

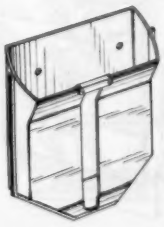
245,557
VALET RACK
John A. Wiser, P.O. Box 192, Liberty, Tex. 77575
Filed Mar. 29, 1976, Ser. No. 671,351
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—117



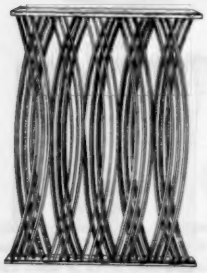
245,558
KITCHEN CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,425
Claims priority, application United Kingdom, Apr. 14, 1975, 970690/75
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—130



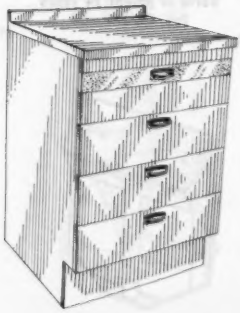
245,559
MOUNTABLE HOLDER FOR A BAG CONTAINING A FLUENT SUBSTANCE
William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.
Filed June 10, 1976, Ser. No. 694,905
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—131



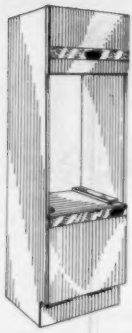
245,560
ROOM DIVIDER
Richard Walton Enners, 9 Barbara Terrace, Middletown, N.J. 07748
Filed Oct. 21, 1975, Ser. No. 624,461
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—139



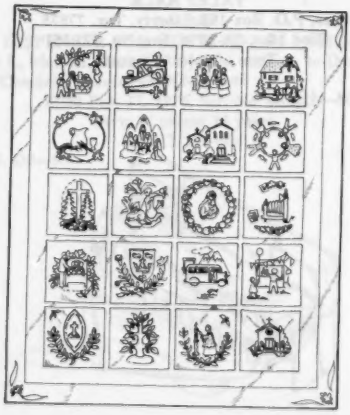
245,561
KITCHEN BASE CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,424
Claims priority, application United Kingdom, Apr. 14, 1975, 970694/75
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—166



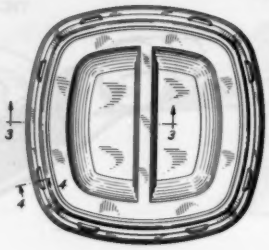
245,562
KITCHEN CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,427
Claims priority, application United Kingdom, Apr. 14, 1975, 970688/75
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—170



245,563
QUILT
Patricia L. Devin, 1933 Mandeville Canyon Road, Los Angeles, Calif. 90049
Filed May 18, 1976, Ser. No. 687,441
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—260

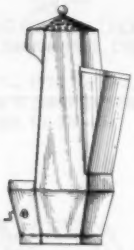


245,564
COVER FOR A PLATE
Richard Lewis Blanchard, St. Charles, Ill., assignor to American Can Company, Greenwich, Conn.
Filed Mar. 14, 1975, Ser. No. 558,459
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—40



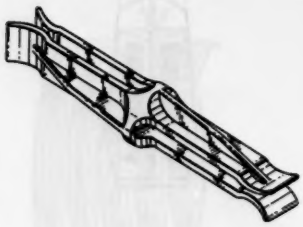
245,565
STRAINER
Fred S. Steiner, Woodmere, and Morison S. Cousins, Plainview, both of N.Y., assignors to Bonny Products, Inc., Hewlett, N.Y.
Filed June 7, 1976, Ser. No. 693,291
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47

245,566
ROTISSERIE COOKER
Chris P. Tomaras, 5450 N. Winthrop Ave., Apt. 405, Chicago, Ill. 60640
Filed Aug. 13, 1975, Ser. No. 604,459
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—110



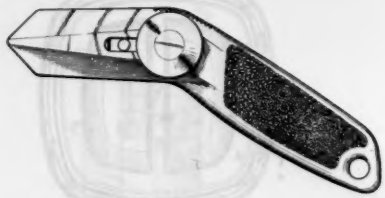
245,567
DISPOSAL FIGURINE
Lee V. Burns, 2118 Canada Blvd., Glendale, Calif. 91208
Filed Oct. 10, 1975, Ser. No. 621,362
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194

245,568
CLOTHES PEG
William Joel Reginald Edlin, R.D. 2, Sharp Road, Katikati, Bay of Plenty, New Zealand
Filed Jan. 5, 1976, Ser. No. 646,471
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—198



245,569
SHEARS
William C. Ferguson, Denville, N.J., assignor to Cooper Industries, Houston, Tex.
Filed Sept. 29, 1975, Ser. No. 617,317
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

245,570
RETRACTABLE BLADE KNIFE
Robert F. West, Simsbury, and Sylvester W. Bies, Bloomfield, both of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed July 1, 1976, Ser. No. 701,852
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



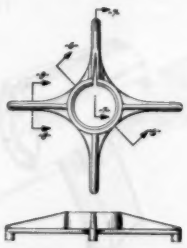
245,571
CAP NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 620,333, Oct. 7, 1975. This application Sept. 3, 1976, Ser. No. 720,452
Claims priority, application Japan, Jan. 7, 1975, 50-27832
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397

245,572
CAP NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 620,334, Oct. 7, 1975. This application Sept. 3, 1976, Ser. No. 720,453
Claims priority, application Japan, Jan. 7, 1975, 50-27833
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397

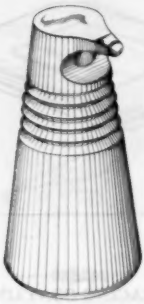
245,573
CAP NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 620,337, Oct. 7, 1975. This application Sept. 3, 1976, Ser. No. 720,455
Claims priority, application Japan, Jan. 7, 1975, 50-27833
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397

245,574
SLEEVE ANCHOR FOR A SANDWICH PANEL
Peter D. Courtois, Oceanside, Calif., and Charles J. Sharav, Chicago, Ill., assignors to Superior Concrete Accessories, Inc.
Filed Nov. 5, 1975, Ser. No. 629,039
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—385

245,575
ELECTRICAL OUTLET GUARD
Jerry C. Frinzel, Sacramento, and Robert H. Britschgi, Fair Oaks, both of Calif., assignors to Robert H. Britschgi, Fair Oaks, Calif.
Filed Oct. 6, 1975, Ser. No. 619,841
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—499



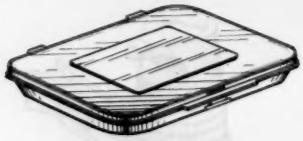
245,576
BOTTLE
Ralph A. Muscatiello, Norwood, and Kent M. Wright, Sudbury, both of Mass., assignors to The Gillette Company, Boston, Mass.
Filed July 14, 1975, Ser. No. 595,664
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2



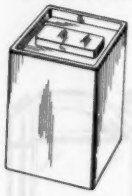
245,577
JUG OR THE LIKE
Wyne M. Smythe, 6417 Bandini Blvd., City of Commerce, Calif. 90040
Filed Aug. 13, 1976, Ser. No. 714,169
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52

245,578
PACKAGING CAPSULE
Richard James Klingaman, Darien, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Feb. 26, 1976, Ser. No. 661,674
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—171

245,579
PACKAGING CONTAINER
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.
Filed Apr. 3, 1975, Ser. No. 564,614
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—231

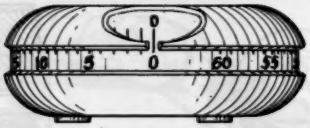


245,580
PACKAGING CONTAINER
Lars Göran Larsson, and Richard Leroy Bruke, both of Malmo, Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden
Filed July 25, 1974, Ser. No. 491,803
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—237

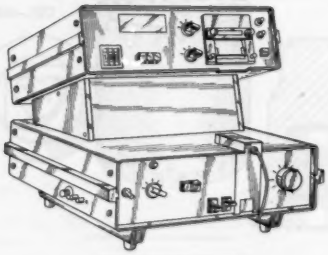


245,581
CLOCK
Virgil Thrasher, Santa Cruz, Calif., assignor to Lucid Lines, Inc., Culver City, Calif.
Filed Dec. 30, 1975, Ser. No. 645,465
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—9

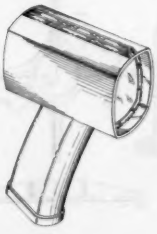
245,582
KITCHEN TIMER OR SIMILAR ARTICLE
Dana W. Mox, Elk Grove Village, Ill., assignor to Hanson Limited, Sligo, Ireland
Filed Feb. 25, 1976, Ser. No. 661,375
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



245,583
PHOTOMETRIC ANALYSIS APPARATUS
Enzo Sergio Mannucci, Siena, Italy, assignor to Istituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A., Siena, Italy
Filed May 4, 1976, Ser. No. 683,229
Claims priority, application Italy, Nov. 7, 1975, 11830/75
Term of patent 14 years
Int. Cl. D24—*02*; D10—*04*
U.S. Cl. D10—46

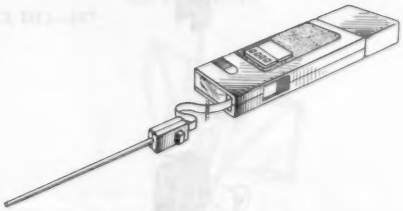


245,584
RADIATION DETECTOR
David C. Byram, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 18, 1974, Ser. No. 515,913
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—47

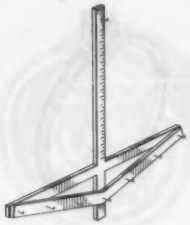


245,585
MOISTURE METER OR SIMILAR ARTICLE
Dorothea Bru, Locust Valley, N.Y., assignor to Aldermaston Inc., Glen Cove, N.Y.
Filed Feb. 18, 1976, Ser. No. 659,065
Term of patent 3½ years
Int. Cl. D10—*04*
U.S. Cl. D10—56

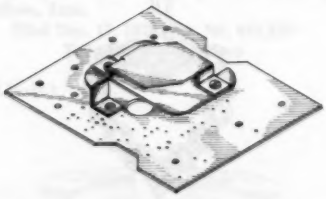
245,586
TEMPERATURE SENSING MECHANISM OR SIMILAR ARTICLE
John F. McGlynn, Valhalla, N.Y.; Robert Doernberg, and Phillip Brookshire, both of Cincinnati, Ohio, assignors to IPCO Hospital Supply Corporation, White Plains, N.Y.
Filed Apr. 14, 1975, Ser. No. 567,749
Term of patent 14 years
Int. Cl. D10—04
U.S. Cl. D10—57



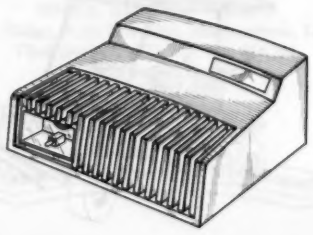
245,587
MEASURING GAUGE AND TOOL FOR MACRAME CORD OR THE LIKE
Robert M. Chaves, 5644 W. Monte Cristo, Glendale, Ariz. 85306
Filed Nov. 6, 1975, Ser. No. 629,408
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71



245,588
IONIZATION SENSOR FOR SMOKE DETECTOR
Henri H. Hoge, 2209 Crest Road, Baltimore, Md. 21209
Filed Mar. 2, 1976, Ser. No. 663,219
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121



245,589
CABINET FOR INTRUDER DETERRENT
James H. Ott, 2375 Covington Road, Apt. 415, Akron, Ohio 44313
Filed Oct. 14, 1976, Ser. No. 732,386
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121

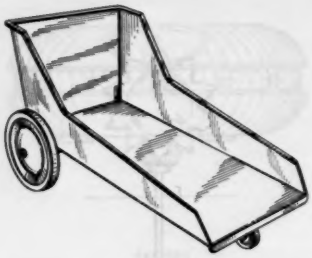


245,590
FINGER RING
Robert C. Laidlaw, Mission Viejo, Calif., assignor to Josten's, Minneapolis, Minn.
Filed Dec. 29, 1975, Ser. No. 644,755
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—36

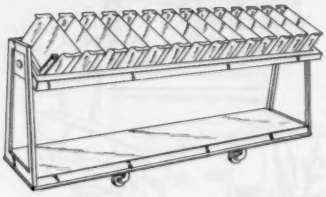
245,591
PENDANT
Fred Rieger, Jr., 42 Todd Drive, East Glen Head, N.Y. 11545, and Fred Kibler, 227-08 64th Ave., Bayside, N.Y. 11364
Filed Mar. 24, 1976, Ser. No. 669,850
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—44

245,592
COMBINED GOLF CAR AND REMOVABLE CANOPY THEREFOR
William G. Davidson, Elm Grove, Wis., assignor to AMF Incorporated, White Plains, N.Y.
Filed Dec. 31, 1975, Ser. No. 645,797
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—16

245,593
MANUALLY PROPELLED AND STEERED CART FOR INVALID CHILDREN
Carol Halpern, 14 Willowbrook Lane, Freeport, N.Y. 11520
Filed June 24, 1976, Ser. No. 699,362
Term of patent 14 years
Int. Cl. D12—*02, 12*
U.S. Cl. D12—26



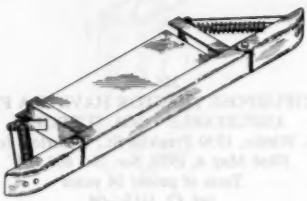
245,594
DOCUMENT HANDLING CART OR SIMILAR ARTICLE
John F. Graham, Sudbury, Mass., and Donald D. Kelemen, Norman, Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed June 4, 1976, Ser. No. 693,031
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—30



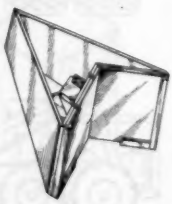
245,595
HAND CART FOR CARRYING A DOOR
Frank W. Johnson, 870 Diablo Road, Danville, Calif. 94526
Filed Oct. 19, 1976, Ser. No. 733,781
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—34

245,596
BICYCLE RACK
Alan B. Cohen, 901 W. Davis St., Ann Arbor, Mich. 48103; Robert S. Marx, 3570 Green Briar Blvd., Ann Arbor, Mich. 48105; Mary Kalmes, 1221 Marsac, Bay City, Mich. 48706, and Peter Anders, 801 Linwood Drive, Midland, Mich. 48640
Filed Sept. 26, 1975, Ser. No. 617,015
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D12—115

245,597
BUMPER
Lawrence A. Gee, and Delbert L. Draisey, both of 6627 196th, Lynnwood, Wash. 98036
Filed July 26, 1976, Ser. No. 708,413
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

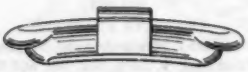


245,598
REAR VIEW MIRROR FOR VEHICLES
Agapito P. Balduman, Calvary Heights, Forestville, Md. 20028
Filed Nov. 15, 1976, Ser. No. 741,736
Term of patent 14 years
Int. Cl. D21—*16*
U.S. Cl. D12—187



245,599
WHEEL
John Robert de Vries, Geldrop, Netherlands, assignor to AB Volvo, Gothenburg, Sweden
Filed Aug. 26, 1976, Ser. No. 717,867
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

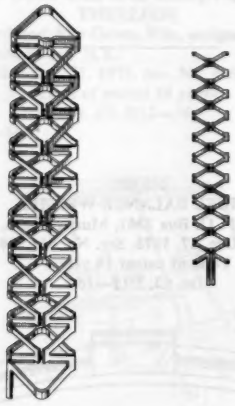
245,600
WHEEL BALANCE WEIGHT
Donald G. Hodge, assignor to Hodge Manufacturing Corp., Murfreesboro, Tenn.
Filed Dec. 17, 1975, Ser. No. 641,533
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—213



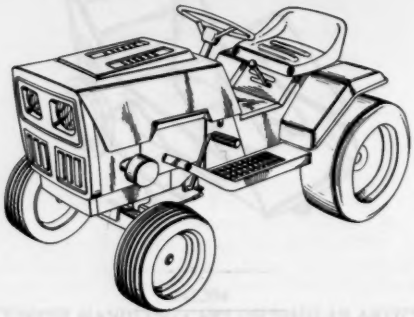
245,601
WHEEL BALANCE WEIGHT
Donald G. Hodge, P. O. Box 1361, Murfreesboro, Tenn. 37130
Filed Dec. 17, 1975, Ser. No. 641,754
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—213

245,602
TELEPHONE STATION HANDSET
Donald Michael Genaro, Haworth; John Alfons Meyerle, Manasquan, both of N.J.; Gordon Elliot Sylvester, Jamaica, N.Y., and Alvin Richard Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 30, 1976, Ser. No. 718,852
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—63

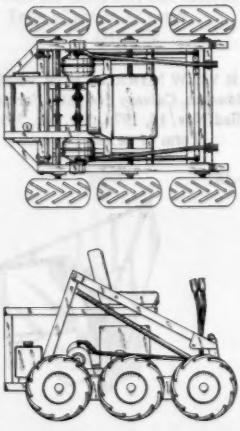
245,603
ANTENNA ELEMENT
Kazuhisa Satoh, 24-10-1, Megurohoncho, Meguro, Tokyo, Japan
Filed Mar. 9, 1976, Ser. No. 665,184
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—90



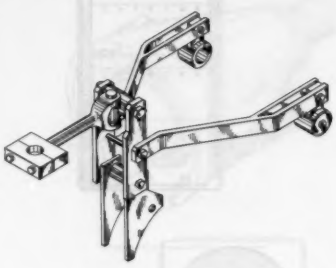
245,604
GARDEN TRACTOR
Larry Monroe Cognata, Nashville, and Richard D. Williams, Brentwood, both of Tenn., assignors to The Murray Ohio Manufacturing Company, Brentwood, Tenn.
Filed Mar. 19, 1976, Ser. No. 668,810
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23



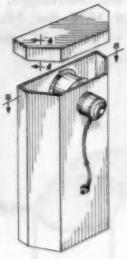
245,605
MULTIPURPOSE TRACTOR HAVING A FRONT ADJUSTABLE TOOL SUPPORT
Rudolph H. Wittke, 1930 Franklin St., Waterloo, Iowa 50703
Filed May 4, 1976, Ser. No. 683,164
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—23



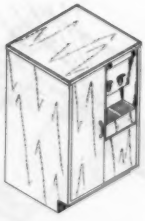
245,606
LOAD TRANSFER APPARATUS FOR CONNECTING A TRACTOR AND A TRAILER
Willard R. Williams, Naturita, Colo., assignor to Williams, Inc., Naturita, Colo.
Filed Dec. 18, 1975, Ser. No. 641,889
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—28



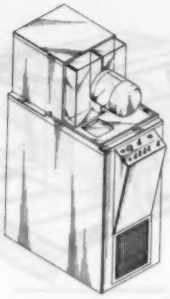
245,607
CYCLE CHAIN CLEANING DEVICE
Jade Del Morrical, 1715 W. Libby St., Phoenix, Ariz. 85023
Filed Feb. 24, 1976, Ser. No. 660,836
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—34



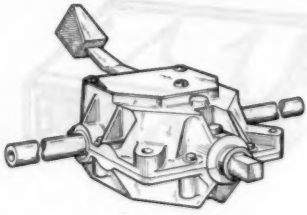
245,608
WATER DISPENSER
William V. Murphy, Philadelphia, Pa., assignor to Refreshment Machinery, Incorporated, Warminster, Pa.
Filed Sept. 22, 1975, Ser. No. 615,314
Term of patent 14 years
Int. Cl. D15—*08*; D23—*99*
U.S. Cl. D15—115



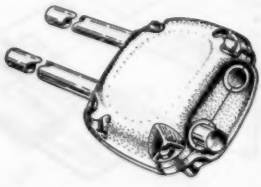
245,609
DRILLING MACHINE
Edgar P. Freer, 7000 Scarborough Peak Drive, Canoga Park, Calif. 91307
Filed Mar. 5, 1976, Ser. No. 664,365
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—132



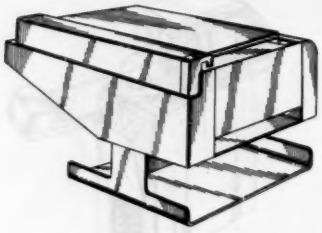
245,610
SMALL TRANSMISSION
Ronald N. Jones, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio
Filed Apr. 22, 1976, Ser. No. 679,181
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—149



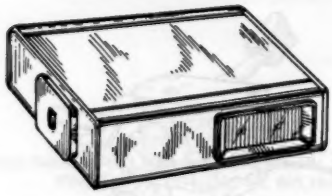
245,611
REVERSING GEAR BOX
Ronald N. Jones, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredricktown, Ohio
Filed Apr. 22, 1976, Ser. No. 679,371
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—149



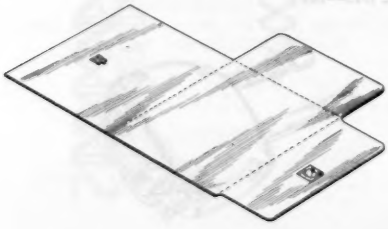
245,612
ELECTROPHOTO COPIER
Karl Gustav Zeuthen, Gentofte, Denmark, assignor to Zeuthen & Aagaard A/S, Glostrup, Denmark
Filed Apr. 10, 1975, Ser. No. 567,003
Claims priority, application Denmark, Oct. 15, 1974, 776/74
Term of patent 14 years
Int. Cl. D16—*3*
U.S. Cl. D16—31



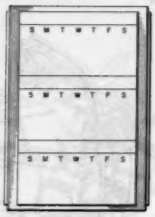
245,613
STROBE
Cooper C. Woodring, Plandome; Ronald Emmerling, New City, both of N.Y., and Michael Boehm, Green Farms, Conn., assignors to J. C. Penney Company, Inc., New York, N.Y.
Division of Ser. No. 483,395, June 26, 1974, Pat. No. D241,167.
This application Mar. 1, 1976, Ser. No. 662,828
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D16—42



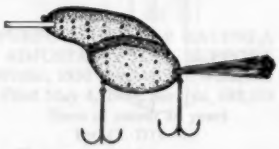
245,614
BLANK FOR AN ENVELOPE
David M. Meeker, Saratoga, Calif., assignor to Champion International Corporation, Stamford, Conn.
Filed Jan. 22, 1976, Ser. No. 651,523
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D19—3



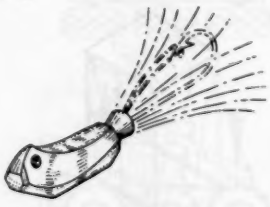
245,615
COMBINED PENCIL WELL AND CALENDAR HOLDER
Robert C. Burroughs, Gaithersburg, Md., assignor to Robert C. Burroughs
Filed June 19, 1975, Ser. No. 588,218
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—85



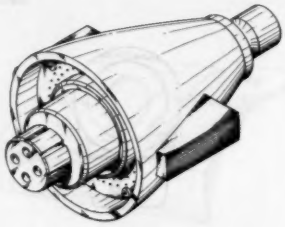
245,616
FISHING LURE
Hugh Stewart, Jr., 112 Pine, Scottsboro, Ala. 35768
Filed Sept. 16, 1976, Ser. No. 723,737
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



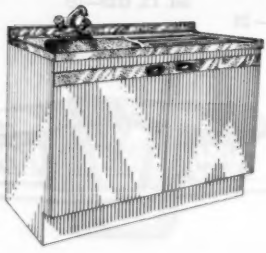
245,617
FISHING JIG
Arlie Spivey, 713 Bahama St., Palm Bay, Fla. 32905
Filed Mar. 7, 1977, Ser. No. 775,194
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



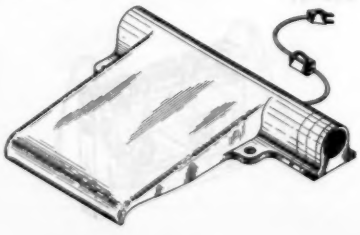
245,618
SHOWERHEAD
Emilie H. Pitman, 16015-35th Northeast, Seattle, Wash. 98155
Filed Aug. 20, 1976, Ser. No. 716,076
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



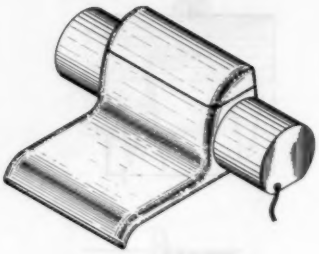
245,619
KITCHEN SINK CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,426
Claims priority, application United Kingdom, Apr. 14, 1975, 97068/75
Term of patent 3½ years
Int. Cl. D23—*02*
U.S. Cl. D23—59



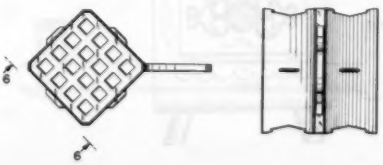
245,620
VENTILATOR FOR A WATER CLOSET
Lambert D. Berry, Rte. 1, Box 232, Silverdale, Wash. 98383
Filed May 24, 1976, Ser. No. 689,138
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



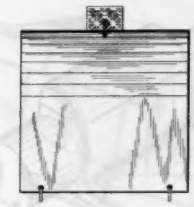
245,621
VENTILATOR FOR A WATER CLOSET
Lambert D. Berry, Rte. 1, Box 232, Silverdale, Wash. 98383
Filed Sept. 30, 1976, Ser. No. 728,450
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



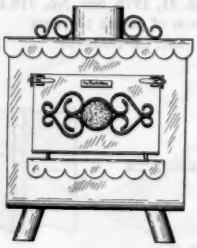
245,622
CHARCOAL FIRE STARTER
Duane L. Storandt, 12 Hanley Downs, St. Louis, Mo. 63117
Filed Aug. 31, 1976, Ser. No. 719,171
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—90.1



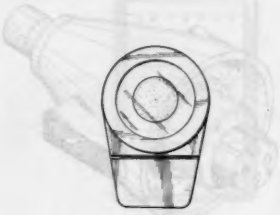
245,623
THERMAL DEFLECTOR FOR FIREPLACES
James Harlan Jenkins, 6010 N. 26th St., Arlington, Va. 22207
Filed Dec. 22, 1975, Ser. No. 642,737
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



245,624
WOOD BURNING HEATING STOVE
Kendrick H. McIntire, Rte. 2, Box 1000, and John E. McIntire, Rte. 2, Box 151-A, both of Aurora, Oreg. 97002
Filed Nov. 3, 1975, Ser. No. 628,565
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—105



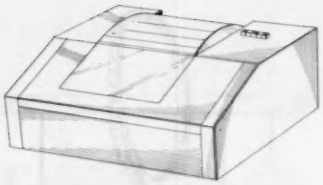
245,625
BIOLOGICAL REACTION FILTER FOR MEDICAL ANALYSIS
Jean Léon Paul Marie Benoit, 74 rue du Fort, St. Irenee, Rhone, France
Filed July 13, 1976, Ser. No. 704,885
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21



245,626
BUILDING FOR FAST FOOD RESTAURANT OR THE LIKE
Raymond Poelvoorde, New York, N.Y., assignor to Hardee's Food Systems, Inc., Rocky Mount, N.C.
Filed Jan. 29, 1976, Ser. No. 653,525
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25

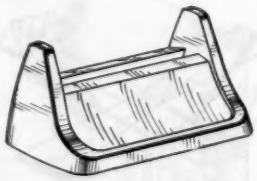
245,627
TAPE CASSETTE
Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed June 25, 1976, Ser. No. 699,980
Claims priority, application Japan, Dec. 27, 1975, 50-51656
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—11

245,628
SOUND REDUCING COVER FOR TELEPRINTER OR THE LIKE
Berndt Ebbe Frick, Herrgardsvagen 9, 135 00 Tyreso, Sweden
Filed Jan. 28, 1975, Ser. No. 544,767
Claims priority, application Sweden, Aug. 5, 1974, 741241
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—93

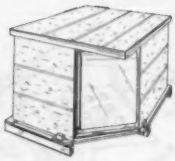


245,629
DRY SHAVER
Roland Ullmann, Hausen, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Taunus, Germany
Filed Nov. 21, 1975, Ser. No. 634,172
Claims priority, application Germany, June 5, 1975, 73 MR 8363
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49

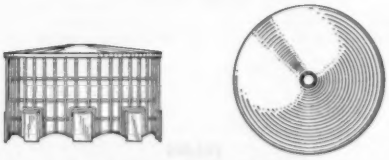
245,630
BLADE GUARD FOR HAIR TRIMMING AND CLIPPING APPARATUS
Robert O. Ernest, Oak Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Dec. 31, 1975, Ser. No. 645,629
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—54



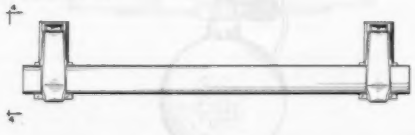
245,631
DOGHOUSE
Charles M. Conner, and Kurt G. Ladwig, both of 9440 Harwin, Suite E, Houston, Tex. 77036
Filed Sept. 19, 1975, Ser. No. 615,170
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



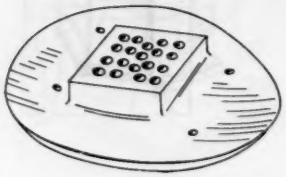
245,632
POULTRY CAGE
Gerald L. Kitson, 9709 Belding Road NE., Rockford, Mich. 49341
Division of Ser. No. 482,373, June 24, 1974, Pat. No. D241,254.
This application Aug. 30, 1976, Ser. No. 718,571
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



245,633
CASKET HANDLE
Bennie R. Johnson, Connersville, Ind., assignor to National Metal Products Co. Inc.
Filed Feb. 2, 1976, Ser. No. 654,390
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D31—11



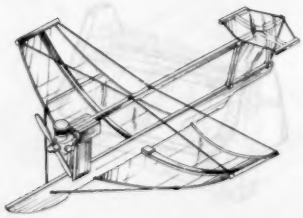
245,634
GOLF CLUB SOLE PLATE
Roy Alexander Churchward, 6444-19th Ave. S., Richfield, Minn. 55423
Filed Nov. 6, 1975, Ser. No. 629,307
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC



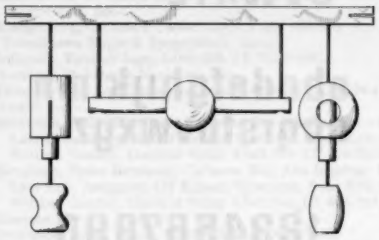
245,635
COMBINED GOLF BALL AND MODEL AIRCRAFT ENGINE NOVELTY DEVICE
John M. Campbell, 866 S. 1100 East, Salt Lake City, Utah 84120
Filed Nov. 17, 1975, Ser. No. 632,351
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 QQ

245,636
TENNIS RACKET FRAME
Ralph Vincent Sawyer, Rumford, R.I., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 18, 1976, Ser. No. 668,155
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

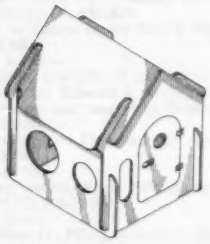
245,637
TOY AIRPLANE
Harvey H. Jewett, 347 Ram Court SE., Olympia, Wash. 98503
Filed Nov. 29, 1974, Ser. No. 528,056
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



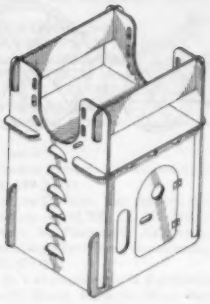
245,638
CRADLE GYM
Kerstin Margaretha Hagland-Ahrnborg, Falun, Sweden, assignor to Brio Toy AB, Sweden
Filed Dec. 24, 1975, Ser. No. 644,059
Claims priority, application Sweden, June 30, 1975, 751314
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 J



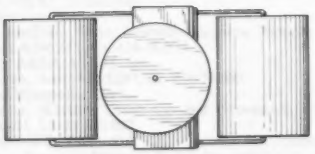
245,639
TOY HOUSE
Elmer C. Powell, Jr., 804 W. Colorado, Dallas, Tex. 75208
Filed May 10, 1976, Ser. No. 684,712
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



245,640
TOY FORT
Elmer C. Powell, Jr., 804 W. Colorado, Dallas, Tex. 75208
Filed May 10, 1976, Ser. No. 684,857
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL

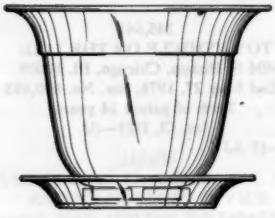


245,641
TOY VEHICLE OR THE LIKE
Ross Young, 5404 S. Bishop, Chicago, Ill. 60609
Filed May 27, 1976, Ser. No. 690,693
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



245,642
TOY VEHICLE OR THE LIKE
Ross Young, 5404 S. Bishop, Chicago, Ill. 60609
Filed May 27, 1976, Ser. No. 690,694
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

245,643
COMBINED FLOWER POT AND TRAY THEREFOR
John Orfei, 14 Ravena St., Revere, Mass. 02151
Filed Jan. 22, 1976, Ser. No. 651,501
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—154



245,644
FONT OF TYPE
Jack E. Pollard, San Francisco, Calif., assignor to Transamerica Corporation
Filed Oct. 28, 1975, Ser. No. 626,153
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

245,645
COMBINED HANDBAG AND DETACHABLE FITTED CLUTCH
Constantine Casser, Port Washington, N.Y., assignor to Amba Marketing Systems, Inc., Greenwich, Conn.
Filed Apr. 14, 1975, Ser. No. 567,710
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF AUGUST, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Friedr. Flender & Co.: *See*—
Punsmann, Josef; and Hecking, Ludger, 4,044,872, Cl. 192-103.00A.

A. H. Robins Company, Incorporated: *See*—
Welstead, William J., Jr.; and Moran, Henry W., 4,045,576, Cl. 424-309.000.

A/S Ardal og Sunndal Verk: *See*—
Eide, Svein, 4,045,654, Cl. 219-449.000.

A. S. Skarpenord: *See*—
Klingenberg, Oystein F., 4,045,320, Cl. 204-197.000.

A/S Trondhjems Nagle & Spigerfabrik: *See*—
Johansen, Randulf Inge, 4,044,608, Cl. 73-88.00C.

AB Hammars Mekaniska Verkstad: *See*—
Ekholm, Rolf; and Danielsson, Hans, 4,044,893, Cl. 214-1.0PB.

AB Hassle: *See*—
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,563, Cl. 424-263.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,564, Cl. 424-263.000.

AB Mecman: *See*—
Tourunen, Pekka Tapio, 4,044,865, Cl. 188-287.000.

Abbas, Shakir Ahmed; and Dockerty, Robert Charles, to International Business Machines Corporation. Process for making field effect and bipolar transistors on the same semiconductor chip. 4,044,452, Cl. 29-571.000.

Abbott Laboratories: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.

ABC Packaging Machine Corporation: *See*—
Reichert, Donald G., 4,044,657, Cl. 93-49.00M.

Abe, Hiroshi: *See*—
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, 4,045,374, Cl. 252-517.000.

Abrashev, Georgi Ivanov: *See*—
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.

Abrial, Lucien, to Creusot-Loire. Device for mounting panels of fibrous refractory material. 4,045,168, Cl. 432-247.000.

Abu-Akeel, Abdulhadi K.; and Rieck, Gerald C., to General Motors Corporation. Support device for rotating bar including an assembly for cushioning and dampening vibratory movement of the bar. 4,044,861, Cl. 188-1.00B.

ACF Industries, Incorporated: *See*—
Crawford, Edward N., 4,044,788, Cl. 137-117.000.

Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., to Varian Associates, Inc. High pressure liquid chromatography system. 4,045,343, Cl. 210-101.000.

Acme Marls Limited: *See*—
Elliott, John, 4,045,167, Cl. 432-241.000.

Acorn Building Components, Inc.: *See*—
Dunstan, James W., 4,045,071, Cl. 294-67.00R.

Acton, Hugh, to Boyertown Burial Casket Company. Casket with supported pallet. 4,044,435, Cl. 27-2.000.

Adachi, Fumio: *See*—
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Adachi, Fumio, 4,045,478, Cl. 260-530.00N.

Adair, Lewell Seidell, to Adams, Barney Silis, Jr. Pipe racking system. 4,044,895, Cl. 214-2.500.

Adams, Barney Silis, Jr.: *See*—
Adair, Lewell Seidell, 4,044,895, Cl. 214-2.500.

Adams, Ben E.; and Gidak, Edward J., Jr., to Duval Corporation. Beneficiation of kieserite and langbeinite from a langbeinite ore. 4,045,335, Cl. 209-166.000.

Adams, Donald N., to Koppers Company, Inc. Adjustable eccentric. 4,044,630, Cl. 74-600.000.

Adams, Roger William: *See*—
Bidwell, Jan Ivan; Adams, Roger William; and Jepson, Walter Brian, 4,045,235, Cl. 106-72.000.

Addison, William E.: *See*—
McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., 4,044,555, Cl. 60-264.000.

Addressograph-Multigraph Corporation: *See*—
Hou, Shou L.; and Blades, John D., 4,044,671, Cl. 101-129.000.

Adelmann, Siegfried: *See*—
Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, 4,045,382, Cl. 260-4.00R.

Adrema Pitney Bowes GmbH: *See*—
Deisting, Horst, 4,044,675, Cl. 101-269.000.

Adrion, David Martin; and Hartsough, Lloyd Bruce, to Procter & Gamble Company, The. Acid treated polyester polyurethane foam end wrap. 4,044,782, Cl. 132-7.000.

Advanced Memory Systems, Inc.: *See*—
Lee, James C. K.; and Donaher, Charles Joseph, 4,045,105, Cl. 339-17.0CF.

AE & CI Limited: *See*—
Start, David Gordon Preston; and Fenwick, John Thomas Francis, 4,045,260, Cl. 149-2.000.

Aeschliman, Eugene, to DeSoto, Inc. Sewing machine support structure and work surface. 4,044,700, Cl. 112-217.100.

Agback, Karl Hubert, to Pharmacia Aktiebolag. 4-(4-Hydroxy- or acetoxy-3-carbomethoxyphenylazo)-benzenesulphonyl chloride. 4,045,429, Cl. 260-207.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Deportes, Charles Henri; Henault, Marc Patrice Sylvain; Tasset, Francis; and Vitter, Gerard Raymond Robert, 4,045,319, Cl. 204-195.00S.
Guiraldenq, Pierre; Treheux, Daniel; and Marchive, Daniel, 4,045,596, Cl. 427-229.000.

AGFA-GEVAERT N.V.: *See*—
Blondeel, Eric Jozef, 4,045,098, Cl. 308-9.000.
Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, 4,045,228, Cl. 96-64.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Current divider. 4,045,694, Cl. 307-296.00R.

Aidn, Martin: *See*—
Schroeder, Harry; and Aidn, Martin, 4,045,755, Cl. 335-274.000.

Air-Industrie: *See*—
Bornert, Paul, 4,045,524, Cl. 261-112.000.

Air Preheater Company, Inc., The: *See*—
Stockman, Richard Franklin, 4,044,822, Cl. 165-9.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Inada, Masami; and Kitamura, Kazuhiko, 4,044,732, Cl. 123-117.00A.
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.

Aizawa, Tatsuo: *See*—
Nakajima, Takanobu; Matsui, Toshikazu; and Aizawa, Tatsuo, 4,045,165, Cl. 432-60.000.

Akagawa, Masatake; and Tamura, Tsutomu, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus for the evaluation of yarn qualities. 4,045,659, Cl. 235-151.300.

Akamatsu, Hideo: *See*—
Koitabashi, Takeo; Akamatsu, Hideo; and Fujimori, Noboru, 4,045,230, Cl. 96-100.00R.

Akamatsu, Hiroshi: *See*—
Nishimura, Akira; Akamatsu, Hiroshi; Negoro, Sentaro; and Yoshida, Yasutoshi, 4,044,495, Cl. 43-121.000.

Akatsuka, Shigeki: *See*—
Tokunou, Takashi; Kouya, Shinichi; and Akatsuka, Shigeki, 4,045,731, Cl. 324-78.00F.

Akermans Verkstad AB: *See*—
Oldaeus, Karl Olof; Tordenmalm, Osten Lars; and Nilsson, Bo Nils, 4,044,610, Cl. 73-133.00R.

Akiyama, Takuya: *See*—
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,045,551, Cl. 424-76.000.

Aktiebolaget ASEA-ATOM: *See*—
van Santen, Aart, 4,045,287, Cl. 176-78.000.

Aktiebolaget Electrolux: *See*—
Kristenson, Kerstin Elisabeth; and Simonsson, Sven Bertil, 4,044,421, Cl. 15-339.000.

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See*—
Ullmann, Werner; Ferroni, Bernardo; and Levy, Gideon N., 4,045,641, Cl. 219-69.00C.

Alexandres, Richard Bernard. Automatic resetting temperature controlled battery changing system. 4,045,720, Cl. 320-35.000.

Alexandrino, Victor M. Non-soil penetrating harvesting blade for sugar cane. 4,044,535, Cl. 56-15.800.

Aliverdizade, Kerim Salim ogly: *See*—
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.

Allen, Joseph C., to Texaco Inc. Secondary recovery process utilizing water saturated with gas. 4,044,831, Cl. 166-275.000.
Allen, Kenneth M. Granular metering. 4,044,926, Cl. 222-409.000.
Allen, Thomas Kenneth: *See—*
Obersby, Derek; and Allen, Thomas Kenneth, 4,044,936, Cl. 225-2.000.
Allied Chemical Corporation: *See—*
Figiel, Francis J., 4,045,365, Cl. 252-141.000.
Figiel, Francis J., 4,045,366, Cl. 252-171.000.
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 4,045,534, Cl. 264-237.000.
Hertzog, Richard Ross, 4,045,540, Cl. 423-385.000.
Rogic, Milorad M.; Swerdloff, Michael D.; and Demmin, Timothy R., 4,045,422, Cl. 260-143.000.
Allis-Chalmers Corporation: *See—*
Waite, John J., 4,044,951, Cl. 239-1.000.
Almedahls Aktiebolag: *See—*
Luther, Harald Johan, 4,044,669, Cl. 101-127.100.
Alnor Instrument Co.: *See—*
Peltola, Veikko K.; and Duros, James M., 4,045,658, Cl. 235-151.300.
Alps Pharmaceutical Ind. Co., Ltd.: *See—*
Kinugasa, Akikazu; Okuda, Toshio; Goto, Makoto; and Saito, Mitsuo, 4,045,450, Cl. 260-343.600.
Alton, Lynn J., to Huntington Mechanical Laboratories, Inc. High temperature, quick access door for high vacuum chambers. 4,044,918, Cl. 220-314.000.
Aluminum Company of America: *See—*
Remaley, Edward G.; Baker, Robert W.; and Meyer, Raymond J., 4,045,599, Cl. 427-333.000.
Turley, Bernard C., 4,045,307, Cl. 204-64.000.
White, Russell L.; and Edwards, Kenneth L., 4,045,308, Cl. 204-67.000.
Alvasum (Aseptic) Limited: *See—*
Summerfield, Francis, 4,044,990, Cl. 251-8.000.
Alza Corporation: *See—*
Spraggins, Robert L., 4,045,577, Cl. 424-311.000.
Amalgamated Sugar Company, The: *See—*
Schoenrock, Karlheinz W. R.; and Rounds, Hugh G., 4,045,242, Cl. 127-50.000.
Amax Inc.: *See—*
Meyer, Harry W., deceased; Baker, Jerry D.; and Ceckler, William H., 4,045,216, Cl. 75-84.000.
American Atomics Corporation: *See—*
Caffarella, Thomas E.; Radda, George J.; and Watts, David J., 4,045,201, Cl. 65-105.000.
American Brands, Inc.: *See—*
Black, James Harold; and Stant, Vernon C., 4,044,528, Cl. 53-192.000.
Kelly, James G., 4,044,780, Cl. 131-135.000.
American Can Company: *See—*
LaCroce, Leonard Thomas; and Radtke, Charles Stephan, 4,044,915, Cl. 220-270.000.
Peterson, Robert J., 4,045,157, Cl. 431-114.000.
American Cyanamid Company: *See—*
Hardy, Robert Allis, Jr.; and Quinones, Nicanor Quinones, 4,045,445, Cl. 260-293.590.
Knapp, Paul William, Jr., 4,045,470, Cl. 260-470.000.
Richter, Ferdinand Joseph, 4,045,364, Cl. 252-106.000.
American Hoechst Corporation: *See—*
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,045,448, Cl. 260-326.50B.
American Microsystems, Inc.: *See—*
Erickson, Bruce G., 4,044,597, Cl. 73-6.000.
Kirkpatrick, James William, Jr., 4,045,785, Cl. 340-173.00R.
American Optical Corporation: *See—*
Shoemaker, Arthur H., 4,045,126, Cl. 350-175.0ML.
American Seating Company: *See—*
Barecki, Chester J.; and Wilkerson, Larry A., 4,045,080, Cl. 297-283.000.
American Tractor Equipment Corporation: *See—*
Wooldridge, Darrel M., 4,044,838, Cl. 172-2.000.
Ames, Thomas J.: *See—*
Bowen, Burlie R.; Barrington, Claud C.; Ames, Thomas J.; and Lochte, Glen E., 4,044,749, Cl. 125-23.00R.
AMF Incorporated: *See—*
Ferrary, Ferdinand F.; Johnson, Herman T.; and Hudson, John H., 4,045,334, Cl. 209-141.000.
AMI Industries, Inc.: *See—*
Schmitt, Marvin G., 4,044,854, Cl. 180-140.000.
Amidon, Roger W.: *See—*
Malz, Russell E., Jr.; Amidon, Roger W.; and Greenfield, Harold, 4,045,484, Cl. 260-561.00H.
Amort, Andrew L., to Xerox Corporation. Apparatus for automatic microphotography. 4,045,016, Cl. 271-155.000.
AMP Incorporated: *See—*
Bunnell, Edward Dennman, 4,044,451, Cl. 29-566.400.
Dechelette, Helen, 4,045,114, Cl. 339-210.00M.
Sterken, Cornelus Adrianus Henricus Maria, 4,045,110, Cl. 339-91.00R.
Amsler, David C.; and Wagner, William E., to Midland-Ross Corporation. Tile wall cover. 4,044,909, Cl. 220-3.800.
Andersen, Jens Arvid, to Norsk Hydro a.s. Method for measuring and control of the energy in aluminum reduction cells. 4,045,309, Cl. 204-67.000.
Anderson, Alan S.; and Cardarelli, John J., to Williamson Corporation. Portable precision radiometer. 4,045,670, Cl. 250-338.000.
Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,045,405, Cl. 260-45.75R.
Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,045,406, Cl. 260-45.75R.
Anderson, Ingvar G.: *See—*
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,044,695, Cl. 110-8.00P.
Anderson, Terry M.; and Schumann, Reinhard, to Warner & Swasey Company, The. Microprogrammed processor system having external memory. 4,045,782, Cl. 364-200.000.
Andersson, Lars; Rehn, Johnny; and Torstenfelt, Ragnar, to Stal-Laval Turbin AB. Rotor for a turbo-machine. 4,045,099, Cl. 308-36.000.
Anic, S.p.A.: *See—*
Romano, Ugo; and Tesei, Renato, 4,045,464, Cl. 260-463.000.
Anker-Holth, Leif. Aircraft with circular wings. 4,044,972, Cl. 244-12.200.
Ankrom, Albert M.; and Vernon, John T., to Rogers Corporation. Comber roll. 4,044,427, Cl. 19-97.000.
Anselmo, Dario, to General-Electro Mechanical Corporation. Rivet blank feeder for riveting apparatus. 4,044,462, Cl. 29-809.000.
Antoine, Pierre Gabriel; Cassonnet, Jean-Claude Marcel; and Vinot, Daniel Rene, to Compagnie Honeywell Bull (Societe Anonyme). Apparatus for detecting and processing errors. 4,045,661, Cl. 235-153.0AC.
Anzani, Alberto, to Bassani Ticione S.p.A. Electrical proximity switch arrangements. 4,045,629, Cl. 200-52.00R.
Aoki, Katashi, to Nissei Plastics Industrial Co., Ltd. Hydraulic control apparatus for injection molding fluent plastic material. 4,044,653, Cl. 91-392.000.
Aoyama, Toshimi: *See—*
Toda, Hiroyuki; Otomegawa, Eiichi; Aoyama, Toshimi; and Nakane, Hisashi, 4,045,231, Cl. 96-115.00P.
Appleberry, Walter Thomas: *See—*
United States of America, National Aeronautics and Space Administration; and Appleberry, Walter Thomas, 4,045,063, Cl. 292-110.000.
Appleman, Milo D.; and DeSantis, Stanislao A., to Decel Corporation. Flavored animal food compositions. 4,045,585, Cl. 426-331.000.
Arai, Mitsuko: *See—*
Watanabe, Kazuko; and Arai, Mitsuko, 4,044,448, Cl. 29-433.000.
Arakawa, Koji, to Toko, Inc. Ceramic filter. 4,045,753, Cl. 333-72.000.
Arakawa, Kunihiko: *See—*
Isaka, Tsutomu; Inoue, Shuji; and Arakawa, Kunihiko, 4,045,515, Cl. 260-897.00A.
Arce, Luis Albert. Short circuit indicator for a terminator matrix. 4,045,623, Cl. 179-175.20R.
Archibald, John Leheup; and Jackson, John Lambert, to John Wyeth & Brother Limited. Piperidyl-glycylamide derivatives. 4,045,566, Cl. 424-267.000.
Archibald, John Leheup: *See—*
Cavalla, John Frederick; and Archibald, John Leheup, 4,045,444, Cl. 260-293.580.
Arens, Alfred: *See—*
Kutzbach, Carl; Arens, Alfred; and Schmidt-Kastner, Gunter, 4,045,552, Cl. 424-94.000.
Arens, Wayne E.: *See—*
United States of America, National Aeronautics and Space Administration; and Arens, Wayne E., 4,045,795, Cl. 343-5.0CM.
Aristonics Corporation: *See—*
Harrington, Laurence P., 4,045,619, Cl. 179-18.0DA.
Arlauskas, Alfonsas; and Loose, Richard D., to General Motors Corporation. Inertia seat back lock. 4,045,079, Cl. 297-216.000.
Arlt, Dieter, to Bayer Aktiengesellschaft. Process for preparing 2-vinyl oxazolines. 4,045,447, Cl. 260-307.00F.
Arlt, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of chlorinated isocyanide dichloride. 4,045,481, Cl. 260-566.00D.
Armijo, Joseph Sam, to General Electric Company. Nuclear fuel element. 4,045,288, Cl. 176-82.000.
Armitage, Dennis Lockhart: *See—*
Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, 4,045,605, Cl. 428-88.000.
Armour and Company: *See—*
Rogers, Alan Barde, 4,045,579, Cl. 426-327.000.
Armstrong Cork Company: *See—*
Williams, Gary E., 4,045,600, Cl. 427-379.000.
Armstrong, Edward T., to Tii Corporation. System for pollution suppression. 4,045,347, Cl. 210-199.000.
Arnold, Franz. Abutment piece adapted to be inserted in a T slot of a machine tool table. 4,045,010, Cl. 269-315.000.
Arnold, Fred E.; and Hedberg, Frederick L., to United States of America, Air Force. Thermally stable, highly fused imide compositions. 4,045,409, Cl. 260-49.000.
Arnold, James F., to HydroTech International, Inc. Apparatus for rigidly interconnecting misaligned pipe ends. 4,045,054, Cl. 285-18.000.
Arnold, Robert Walker; and Tomasky, Thomas, to International Business Machines Corporation. Method and apparatus for adjusting the velocity of ink drops in an ink jet printer. 4,045,770, Cl. 346-75.000.
Arnold, William Brenton. Board game apparatus. 4,045,031, Cl. 273-134.0AT.
ARP Instruments, Inc.: *See—*
Pearlman, Alan R.; and Colin, Dennis P., 4,044,642, Cl. 84-1.100.
Artz, Kenneth W., to Kosgegi Leather & Vinyl Products, Inc. Article

carrier with improved combination belt loop and clip. 4,044,933, Cl. 224-26.00R.

Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich. Blowout ram preventer. 4,044,988, Cl. 251-1.00A.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Akagawa, Masatake; and Tamura, Tsutomu, 4,045,659, Cl. 235-151.300.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Takeda, Hideomi; and Kikuchi, Kazuo, 4,045,804, Cl. 354-25.000.

Asai, Komei: *See—*
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, 4,045,791, Cl. 340-324.00M.

Asano, Kazuhiro, to Kabushiki Kaisha Daini Seikosha. Level shift circuit. 4,045,691, Cl. 307-264.000.

Asano, Kazuhiro: *See—*
Yagi, Kenjiro; and Asano, Kazuhiro, 4,044,544, Cl. 58-23.00R.

Ashby, Eugene C., to Ethyl Corporation. Manufacture of complex hydrides. 4,045,545, Cl. 423-644.000.

Ashiuchi, Kenzo: *See—*
Mori, Yasamasu; Ashiuchi, Kenzo; Yasytome, Osamu; and Sawamura, Tagayasu, 4,045,703, Cl. 313-497.000.

Ashland Oil, Inc.: *See—*
Richards, Harvey J.; and Trivedi, Bhupendra C., 4,045,441, Cl. 260-289.0XA.

Asinger, Friedrich; Offermanns, Heribert; and Gulzek, Karl-Heinz, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process of preparing penicillamine. 4,045,479, Cl. 260-534.00S.

Asmus, Carl J., to Clayton Manufacturing Company. Wheel-engaging roller structure for vehicle testing apparatus. 4,044,609, Cl. 73-117.000.

Atari, Inc.: *See—*
Bristow, Stephen D., 4,045,789, Cl. 340-324.0AD.

Ateliers et Chantiers de Bretagne: *See—*
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.

Atkins, Carl E.; and McGuirk, Francis A., Jr., to Wagner Electric Corporation. Dual channel wide-band frequency modulated keyable control circuit and keying circuit therefor. 4,045,778, Cl. 340-171.0PF.

Attwood Corporation: *See—*
Dekker, Donald Allen, 4,044,624, Cl. 74-552.000.

Ault Incorporated: *See—*
Prince, Luther T., Jr., 4,044,458, Cl. 29-605.000.

Aureli, William D., to Scovill Manufacturing Company. Waistband fastener having substantially identical parts. 4,044,433, Cl. 24-227.000.

Austin, Walter H. Card storage and dispensing device. 4,045,102, Cl. 312-61.000.

Automobiles Peugeot: *See—*
Lemonnier, Jean-Yves; and Chatelain, Lucien, 4,045,521, Cl. 261-41.00R.

Automotive Products Company Ltd.: *See—*
Parsons, David; and Leigh-Monstevens, Keith Vernon, 4,044,873, Cl. 192-106.200.

Avcin, France, to Hirtenberger Patronen-, Zundhutchen- und Metallwarenfabrik Aktiengesellschaft. Jacketless hunting bullet with rollback cutting flags. 4,044,685, Cl. 102-91.000.

Avco Corporation: *See—*
Crimi, Peter, 4,045,146, Cl. 416-1.000.
Debolt, Harold E., 4,045,597, Cl. 427-248.00A.

Averette, Julius P., Jr.: *See—*
Harris, Rano J., Sr.; Harris, Rano J., Jr.; and Averette, Julius P., Jr., 4,044,616, Cl. 73-422.0GC.

Avicon, Inc.: *See—*
Battista, Orlando A.; and Ward, Richard L., 4,045,238, Cl. 106-122.000.

Avrillon, Rene; and Defives, Daniel, to Institut Francais du Petrole. Process for regenerating lubricating oils. 4,045,330, Cl. 208-180.000.

Avtex Fibers Inc.: *See—*
Knopka, William N., 4,045,513, Cl. 260-860.000.

Axt, Wallis C.: *See—*
D'Haem, Marcel P.; and Axt, Wallis C., 4,044,625, Cl. 74-558.500.

Ayusawa, Masatake: *See—*
Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, 4,045,178, Cl. 23-254.00E

Azemar, Michel; and Viglicca, Lucien, to Rhone-Poulenc Industries. Autoclave. 4,045,185, Cl. 23-290.000.

B-Line Systems, Inc.: *See—*
Kowalski, Joseph W., 4,044,428, Cl. 24-16.00R.

Babayan, Eduard P.; and Rourke, Michael H., to Hitco. Polyurethane and composite thereof. 4,045,527, Cl. 264-46.700.

Babcock, Henry Nash: *See—*
Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry Nash, 4,045,237, Cl. 106-89.000.

Babcock & Wilcox Company, The: *See—*
Feldstein, Joel Gary; and Martin, Jeffrey Forsha, 4,044,798, Cl. 138-90.000.

Babunovic, Momir; and Whitlock, Donald E., to Barry-Wehmiller Company. Label removal apparatus for container washing machines. 4,044,783, Cl. 134-73.000.

Baczuk, Robert J., to United States of America, Navy. Molecular sieve containing stabilization system for urethane - crosslinked double base propellant. 4,045,261, Cl. 149-19.800.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Kniese, Wilhelm; and Nienburg, Hans Juergen, 4,045,492, Cl. 260-604.0HF.

Baggs, Burton D., Jr.: *See—*
Smith, Alexander; and Baggs, Burton D., Jr., 4,044,841, Cl. 172-72.000.

Bailey Meter Company: *See—*
Warrick, James C., 4,044,651, Cl. 91-47.000.

Bakel, Adrianus Maria Van; and Fransen, Jan Josephus Bernardus, to U.S. Philips Corporation. Getter for use in the manufacture of an electric discharge tube. 4,045,367, Cl. 252-181.400.

Baker, Don R., to Stauffer Chemical Company. Diphenyl ether amides. 4,045,208, Cl. 71-95.000.

Baker International Corporation: *See—*
Crowe, Talmadge L., 4,044,826, Cl. 166-120.000.
Richard, Charles A.; and Barbee, John Philip, 4,044,832, Cl. 166-278.000.

Baker, Jerry D.: *See—*
Meyer, Harry W., deceased; Baker, Jerry D.; and Ceckler, William H., 4,045,216, Cl. 75-84.000.

Baker, Kenneth L., to United States of America, Army. Method for optimizing the bandwidth of a radio receiver. 4,045,740, Cl. 325-427.000.

Baker, Robert W.: *See—*
Remaley, Edward G.; Baker, Robert W.; and Meyer, Raymond J., 4,045,599, Cl. 427-333.000.

Baker, Woodrow A. Apparatus for filling containers with dehydrated agglomerates. 4,044,803, Cl. 141-34.000.

Balanis, Constantine A.: *See—*
Shuck, Lowell Z.; Fasching, George E.; and Balanis, Constantine A., 4,045,724, Cl. 324-6.000.

Balaz, Alexander, to Quaker Oats Company, The. Apparatus for making a marbled meat food product. 4,044,661, Cl. 99-355.000.

Baldwin, Henry Clay, III. Cold therapeutic package. 4,044,773, Cl. 128-402.000.

Bancroft, Lewis Clinton: *See—*
Williston, David Wyckoff; Bancroft, Lewis Clinton; and Hiller, Dale Murray, 4,045,544, Cl. 423-607.000.

Banhidy, Detre M.: *See—*
Williams, Harrison L.; and Banhidy, Detre M., 4,045,665, Cl. 240-51.11R.

Banks, William P.; and Martin, Larry D., to Halliburton Company. Passivating metal surfaces. 4,045,253, Cl. 148-6.14R.

Barak, Amitzur Z., to United States of America, Energy Research and Development Administration. Solar collector with altitude tracking. 4,044,752, Cl. 126-270.000.

Barbee, John Philip: *See—*
Richard, Charles A.; and Barbee, John Philip, 4,044,832, Cl. 166-278.000.

Barber, Randy B.: *See—*
Rapoport, Henry; and Barber, Randy B., 4,045,440, Cl. 260-285.000.

Barbier, Georges, to Commissariat a l'Energie Atomique. Method and a device for thermal monitoring of a nuclear reactor core. 4,045,282, Cl. 176-19.00R.

Barchewitz, Ekkehard: *See—*
Baumgaertner, Heinrich; and Barchewitz, Ekkehard, 4,045,285, Cl. 176-39.000.

Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, to Hauni-Werke Korber & Co. KG. Apparatus for making composite filter plugs. 4,044,659, Cl. 93-77.0FT.

Barecki, Chester J.; and Wilkerson, Larry A., to American Seating Company. Fastening system for removable seat insert. 4,045,080, Cl. 297-283.000.

Barkan, Philip, to General Electric Company. Gas-blast electric circuit interrupter of the puffer type. 4,045,633, Cl. 200-148.00A.

Barney Knitting Machinery Co., Inc.: *See—*
Lombardi, Anthony Joseph, 4,045,272, Cl. 156-380.000.

Baron, George B., to Marion Power Shovel Company, Inc. Specific linkage arrangement for bucket control. 4,044,903, Cl. 214-138.00R.

Barooshian, Charles T.: *See—*
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 4,045,814, Cl. 358-124.000.

Barowski, Gerhard; Keller, Wolfgang; and Schroetter, Gerhard, to Siemens Aktiengesellschaft. Support device for use in a crucible-free floating zone melting apparatus. 4,045,183, Cl. 23-273.0SP.

Barrington, Claud C.: *See—*
Bowen, Burlie R.; Barrington, Claud C.; Ames, Thomas J.; and Lochte, Glen E., 4,044,749, Cl. 125-23.00R.

Barron, James Elliott, to Magnatex Corporation. Tufting button. 4,044,412, Cl. 5-356.000.

Barron, Mark B.: *See—*
Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, 4,045,810, Cl. 357-24.000.

Barrows, Albert G., to Bogiovanni, John P. Building panel. 4,044,520, Cl. 52-309.120.

Barrus, Donald Martin: *See—*
Noyes, Richard Croissant; Dupen, Clive Frederick George; Barrus, Donald Martin; and Siegel, Edward Arnold, 4,045,283, Cl. 176-35.000.

Barrus, Gordon Brent; and Emenaker, Leo Joseph, to Printronix, Inc. Print hammer mechanism. 4,044,668, Cl. 101-93.040.

Barry-Wehmiller Company: *See*—
Babunovic, Momir; and Whitlock, Donald E., 4,044,783, Cl. 134-73.000.
Bartell, Dwight O.: *See*—
Smashey, Russell W.; and Bartell, Dwight O., 4,044,815, Cl. 164-35.000.
Bartell, John B.: *See*—
Stohlquist, Roger H.; and Bartell, John B., 4,045,275, Cl. 156-521.000.
Barten, Piet Gerard Joseph, to U.S. Philips Corporation. Eccentrically mounted six-pole rings for a static convergence unit. 4,045,754, Cl. 335-212.000.
Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,045,436, Cl. 544-23.000.
Barth, Wayne E., to Pfizer, Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,045,437, Cl. 544-17.000.
Bartram, Trevor Carlisle; and Hazell, Paul Alexander. Magnetic field systems employing a superconducting D.C. field coil. 4,045,716, Cl. 318-154.000.
Basel, Donald R.; and Kawolics, Raymond P. Pinch tube valve. 4,044,989, Cl. 251-7.000.
BASF Aktiengesellschaft: *See*—
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.
Tartter, Arnold, 4,045,424, Cl. 260-147.000.
BASF Wyandotte Corporation: *See*—
Boggs, Frank, Jr., 4,045,323, Cl. 204-266.000.
Login, Robert B., 4,045,510, Cl. 260-830.00P.
Bassani Ticione S.p.A.: *See*—
Anzani, Alberto, 4,045,629, Cl. 200-52.00R.
Bassinger, Grey: *See*—
Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, 4,044,844, Cl. 173-73.000.
Bassinger, Ross: *See*—
Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, 4,044,844, Cl. 173-73.000.
Bassinger Tool Enterprises, Ltd.: *See*—
Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, 4,044,844, Cl. 173-73.000.
Bastien, Jean: *See*—
Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, 4,045,213, Cl. 75-48.000.
Battelle Memorial Institute: *See*—
Trumbull, Harold E.; and Poeth, Dean F., 4,044,904, Cl. 214-152.000.
Battista, Orlando A.; and Ward, Richard L., to Avicon, Inc. Regenerated cellulose sponge. 4,045,238, Cl. 106-122.000.
Bauer, Artur: *See*—
Schabert, Hans-Peter; Porner, Horst; and Bauer, Artur, 4,044,898, Cl. 214-18.00N.
Bauer, Fritz, to Suspa Federungstechnik Fritz Bauer & Sohne OHG. Gas spring. 4,045,008, Cl. 267-120.000.
Bauer, Werner R., to Robertshaw Controls Company. Cut-back thermostat construction. 4,045,759, Cl. 337-301.000.
Bauman, Thomas G.: *See*—
Hutton, James C.; Bauman, Thomas G.; and Rowlands, Kenneth C., 4,044,487, Cl. 42-16.000.
Baumgaertner, Heinrich; and Barchewitz, Ekkehard, to Hochtemperatur-Reactorbau GmbH. Plant for the production of hydrogen through utilization of heat energy obtained from a gas-cooled nuclear reactor. 4,045,285, Cl. 176-39.000.
Bayer Aktiengesellschaft: *See*—
Arlt, Dieter, 4,045,447, Cl. 260-307.00F.
Arlt, Dieter, 4,045,481, Cl. 260-566.00D.
Bock, Manfred; Uerdingen, Walter; and Pedain, Josef, 4,045,462, Cl. 260-453.0AP.
Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, 4,045,382, Cl. 260-4.00R.
Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, 4,045,457, Cl. 260-381.000.
Hamprecht, Rainer, 4,045,430, Cl. 260-208.000.
Judat, Artur; Judat, Helmut; and Grah, Gerd, 4,045,190, Cl. 55-93.000.
Klein, Alfons; and Wedemeyer, Karlfried, 4,045,499, Cl. 260-621.00R.
Kleinstuck, Roland, 4,045,460, Cl. 260-448.80R.
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H.
Krall, Hermann-Dieter; and Schwarz, Hans-Helmut, 4,045,486, Cl. 260-566.00R.
Kutzbach, Carl; Arens, Alfred; and Schmidt-Kastner, Gunter, 4,045,552, Cl. 424-94.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,045,571, Cl. 424-273.00P.
Schwickart, Karl-Josef; and Sesterhenn, Lothar, 4,045,325, Cl. 204-286.000.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,045,496, Cl. 260-613.00D.
Vogel, Axel, 4,045,455, Cl. 260-369.000.
Baylis, Howard Raymond; and Edwards, Roger Alan, to Monotype Corporation Limited, The. Photocomposing apparatus. 4,045,803, Cl. 354-5.000.
BBC Brown Boveri & Company Limited: *See*—
Hohn, Alfred, 4,044,561, Cl. 60-657.000.
Beale, Julian Robert Anthony: *See*—
Shannon, John Martin; and Beale, Julian Robert Anthony, 4,045,248, Cl. 148-1.500.
Bean, Lloyd F., to Xerox Corporation. Method of reproducing color highlighted documents. 4,045,219, Cl. 96-1.200.
Beauchet, Jean, to Societe Nouvelle de Roulements. Concentric antifriction bearing assembly. 4,045,100, Cl. 308-183.000.
Bechem, Hannelore: *See*—
Bechem, Karl-Gunther, 4,045,088, Cl. 299-31.000.
Bechem, Karl-Gunther, to Bechem, Hannelore; and Binnewies, Ingrid. Oscillating disk thin seam mining machine with steering. 4,045,088, Cl. 299-31.000.
Beck, Dieter: *See*—
Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, 4,045,580, Cl. 424-330.000.
Beck, James R.; and Yahner, Joseph A., to Eli Lilly and Company. 3-Cyanoalkylthio- or 3-alkoxycarbonylmethylthio-2,6-di-nitroanilines. 4,045,466, Cl. 260-465.00E.
Becker, Mitchell; and Valbert, Jon R., to Halcon International, Inc. Process for the recovery of alkylene glycols. 4,045,294, Cl. 203-69.000.
Becker & Van Hullen, Niederrheinische Maschinen Fabrik: *See*—
Lange, Wolfgang; and Schafer, Werner, 4,045,274, Cl. 156-492.000.
Beckman Instruments, Inc.: *See*—
Sternberg, James C., 4,045,296, Cl. 195-103.50R.
Beckman, Paul, to IPCO Hospital Supply Corporation. Thermometer. 4,044,614, Cl. 73-371.000.
Belden Corporation: *See*—
Torgerson, Duane E., 4,045,611, Cl. 174-121.0SR.
Bell Fibre Products Corporation: *See*—
Geschwender, Robert C., 4,045,268, Cl. 156-197.000.
Bell Helmets Inc.: *See*—
Lewicki, Lester R.; and Santacroce, James D., 4,044,400, Cl. 2-421.000.
Bell & Howell Company: *See*—
Watson, Charles J.; and Langrehr, Larry L., 4,045,136, Cl. 355-83.000.
Bell Telephone Laboratories, Incorporated: *See*—
James, Dennis Bryan; Liu, Chao Kai; and Smith, Douglas Charles, 4,045,615, Cl. 179-1.0CN.
Miller, Barry, 4,045,725, Cl. 324-30.00B.
Belsky, Valentin Innokentievich: *See*—
Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich, 4,045,006, Cl. 266-149.000.
Bendix Corporation, The: *See*—
Scopaz, Joseph T., 4,045,662, Cl. 235-153.00A.
Benedetto, Alexandre; Cuvillier, Roger O.; and Gony, Jean-Noel, to Bureau de Recherches Geologiques et Minieres. Mechanical method for separating fractions of incinerated urban refuse or similar industrial refuse. 4,044,956, Cl. 241-24.000.
Beneke, Wolfgang. Device for the pneumatic feeding of a quantity of cards. 4,045,091, Cl. 302-28.000.
Bengt Lundin AB: *See*—
Kramming, Erik, 4,044,890, Cl. 206-493.000.
Bennes Marrel: *See*—
Tardy, Maurice; and Paulet, Jean, 4,044,795, Cl. 137-625.600.
Benson, Glendon M., to New Process Industries, Inc. Thermal oscillator. 4,044,558, Cl. 60-520.000.
Benson, Herbert L., Jr., to Shell Oil Company. Isomerization of paraffinic hydrocarbons with fused salt complex of aluminum halide and manganous halide deposited on a carrier. 4,045,509, Cl. 260-683.750.
Benthin, Frank: *See*—
Eckstein, Wolfgang; and Benthin, Frank, 4,045,192, Cl. 55-222.000.
Benz & Hilgers GmbH.: *See*—
Reinecke, Guenter, 4,044,896, Cl. 214-8.50H.
Berger, Erich, to U.S. Philips Corporation. Slipping coupling for a recording and/or playback apparatus. 4,044,868, Cl. 192-12.00B.
Berger, Henry F. Chemical mixing and pumping apparatus. 4,045,004, Cl. 259-4.00R.
Berger, Jacob E. Tissue specimen container. 4,045,291, Cl. 195-127.000.
Berlin, Alla Markovna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Bernardi, Carl E., to National Semiconductor Corporation. Method and apparatus for plating the posts of a semiconductor chip header. 4,045,321, Cl. 204-202.000.
Bernardin, Leo J.: *See*—
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Bernardin, Leo J., 4,044,766, Cl. 128-285.000.
Bernasconi, Raymond: *See*—
Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, 4,045,580, Cl. 424-330.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, to AB Hassle. Substituted 2-[pyridylalkylenesulfinyl]-benzimidazoles with gastric acid secretion inhibiting effects. 4,045,563, Cl. 424-263.000.

Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, to AB Hassle. Benzimidazole derivatives useful as gastric acid secretion inhibitors. 4,045,564, Cl. 424-263.000.

Bettens, Jean-Paul, to Modulo S.A. Kit with male and female elements having deformable gripping means. 4,044,497, Cl. 46-17.000.

Betz Laboratories, Inc.: *See*—
Lange, K. Robert, 4,045,244, Cl. 134-22.00R.

Beveridge, John, to Metal Box Limited. Containers having protective opening edges. 4,044,916, Cl. 220-270.000.

Bhardwaj, Mahesh C.; and Englert, William J., to PPG Industries, Inc. Composite seal for a glass forming chamber. 4,045,203, Cl. 65-182.00R.

Bhutani, Sudhir K.; and Nichols, Willard A., to Olin Corporation. Process for producing high purity para-chlorobenzotrifluoride. 4,045,502, Cl. 260-651.00F.

Bianchi, Giuseppe, to I.GE.Co. Z.r.l. Cellular cement composition. 4,045,236, Cl. 106-88.000.

Bianchi, Thomas A., to Eastman Kodak Company. Method for making o- and p- haloalkyl styrenes. 4,045,501, Cl. 260-651.00R.

Biberg, Odd Bjorn. Machine for forming trenches for pipelines or the like in the sea bed. 4,044,566, Cl. 61-72.400.

Bicosa Societe de Recherches: *See*—
de Mere, Henri Edouard Courier, 4,044,681, Cl. 102-70.20R.

Bidwell, Jan Ivan; Adams, Roger William; and Jepson, Walter Brian, to English Clavs Lovering Pochin & Company, Limited. Treatment of clay minerals. 4,045,235, Cl. 106-72.000.

Bien, Hans-Samuel: *See*—
Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, 4,045,457, Cl. 260-381.000.

Bierer, William F. Patient transport with oxygen supply. 4,045,044, Cl. 280-87.02R.

Biesecker, Frederick S., to Ranco Incorporated. Method and apparatus for controlling air-conditioning systems. 4,044,823, Cl. 165-16.000.

Biller, Bruce A.; and Scherer, Henry W., to S&C Electric Company. Valve arrangement for high voltage fuse. 4,045,758, Cl. 337-186.000.

Billgren, Karl Lennart. Air terminal building. 4,044,516, Cl. 52-174.000.

Billi, S.p.A.: *See*—
Micheletti, Arrigo, 4,044,574, Cl. 66-187.000.

Billings Energy Corporation: *See*—
Campbell, Barrie C., 4,045,303, Cl. 204-24.000.

Bing, Bari; and Sloan, Barbara S. Clasp for jewelry chain. 4,044,430, Cl. 24-201.00R.

Binnewies, Ingrid: *See*—
Bechem, Karl-Gunther, 4,045,088, Cl. 299-31.000.

Bird, Forrest M. Ventilator and method. 4,044,763, Cl. 128-145.800.

bison-Werke Bahre & Greten GmbH & Co. KG: *See*—
Greten, Berndt, 4,045,531, Cl. 264-113.000.

Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., to Caterpillar Tractor Co. Fluoroelastomer-polyacrylate based friction material. 4,045,402, Cl. 260-42.180.

Black and Decker Manufacturing Company, The: *See*—
Lessig, William Ralph, III, 4,044,532, Cl. 56-10.500.

Black, James Harold; and Stant, Vernon C., to American Brands, Inc. Method and apparatus for forming sealed packages. 4,044,528, Cl. 53-192.000.

Black, Philip W.: *See*—
Pitt, Gillies D.; and Black, Philip W., 4,045,668, Cl. 250-227.000.

Blades, John D.: *See*—
Hou, Shou L.; and Blades, John D., 4,044,671, Cl. 101-129.000.

Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., to Xonics, Inc. Electrostatic fountain developer. 4,044,718, Cl. 118-647.000.

Blakely, Stephen W., to Olin Corporation. Quick-connect coupling. 4,045,055, Cl. 285-33.000.

Blazevic, Nikola: *See*—
Kajfez, Franjo; Blazevic, Nikola; and Sunjic, Vitomir, 4,045,569, Cl. 424-274.000.

Blechen, Frederick C.; and Roberts, Lloyd L., to McDonnell Douglas Corporation. Aircraft speed command system. 4,044,975, Cl. 244-181.000.

Blondeel, Eric Jozef, to AGFA-GEVAERT N.V. Fluid bearing. 4,045,098, Cl. 308-9.000.

Blum, Jacques Marcel; Grenon, Michel; and Ventre, Edmond, to Electricite de France (Service National); and Pechiney Ugine Kuhlmann. Molten fuel-salt reactor. 4,045,286, Cl. 176-49.000.

Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, to Coal Industry (Patents) Limited. Cellular material. 4,045,380, Cl. 260-2.5HA.

Bock, Manfred; Uerdingen, Walter; and Pedain, Josef, to Bayer Aktiengesellschaft. Bicyclic triisocyanates. 4,045,462, Cl. 260-453.0AP.

Bodor, Nicolae S.: *See*—
Kaminski, James J.; and Bodor, Nicolae S., 4,045,578, Cl. 424-311.000.

Boehme, Detlef R.: *See*—
Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 4,045,343, Cl. 210-101.000.

Boehmer, Georg, to Siemens Aktiengesellschaft. Apparatus for advancing a ribbon in office typewriters, teleprinters, data printers and the like. 4,044,883, Cl. 197-151.000.

Boeing Company, The: *See*—
Eisner, Steve; and Powell, James LeRoy, 4,045,356, Cl. 225-2.000.
Moorehead, James R., 4,044,973, Cl. 244-54.000.
Vermilye, Michael Lee, 4,044,550, Cl. 60-39.09R.

Boggs, Frank, Jr., to BASF Wyandotte Corporation. Anolyte sealing, electrical insulating for electrolytic cells. 4,045,323, Cl. 204-266.000.

Bogiovanni, John P.: *See*—
Barrows, Albert G., 4,044,520, Cl. 52-309.120.

Bom, Cornelis Johannes Gerardus: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,044,840, Cl. 172-59.000.

Bonderman, Dean P.: *See*—
Proksch, Gary J.; and Bonderman, Dean P., 4,045,176, Cl. 23-230.00B.

Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., to Gulf Research & Development Company. Hydrodesulfurization apparatus with upstaged reactor zones. 4,045,182, Cl. 23-288.00R.

Booher, Howard, to Bruce, Robert J.; and Tate, Mark T., part interest to each. Horizontally discharging semi-trailer. 4,044,899, Cl. 214-82.000.

Bordelon, Lewis O. Protective device. 4,044,922, Cl. 222-183.000.

Borden Chemical Company (Canada) Limited, The: *See*—
Chiu, Shui-Tung; and Turko, William Melvin, 4,045,595, Cl. 427-202.000.

Borg, John P. Automatic electrical plug release. 4,045,106, Cl. 339-45.00R.

Borg-Warner Corporation: *See*—
Fogelberg, Mark John, 4,044,870, Cl. 192-89.00W.

Bornert, Paul, to Air-Industrie. Installations for washing a polluted gas. 4,045,524, Cl. 261-112.000.

Bos, Jules; and von der Kall, Gunter, to U.S. Philips Corporation. Method of and device for grinding grooves. 4,044,509, Cl. 51-206.00P.

Bottai, Gabriele: *See*—
Piccolo, Luigi; Bottai, Gabriele; Paolinelli, Antonio; and La Rovere, Angelo, 4,045,205, Cl. 71-31.000.

Bottum, Edward W.; and Rockwell, Frank H., to Refrigeration Research, Inc. Solar heating system component. 4,044,948, Cl. 237-1.00A.

Boucher, Raymond W.; and Ziegler, William H., Jr., to Hedstrom Co. Foldable child walker. 4,045,045, Cl. 280-87.02W.

Bouton, John C.; Partin, Melvin E.; and Hilghman, Robert C., to Geometric Data Corporation. Automatic focusing system. 4,045,772, Cl. 340-146.30B.

Bowe, Bohler & Weber KG Maschinenfabrik: *See*—
Fuhring, Heinrich; and Sieber, Johannes Helmut, 4,045,174, Cl. 8-142.000.

Bowen, Burlie R.; Barrington, Claud C.; Ames, Thomas J.; and Lochte, Glen E., to HydroTech International, Inc. Concrete removal tool. 4,044,749, Cl. 125-23.00R.

Bowen, Glenn W.: *See*—
Sidor, Edward Frank; Camillo, Charles Carl; and Bowen, Glenn W., 4,045,787, Cl. 340-197.000.

Bowmar Instrument Corporation: *See*—
Yoder, Alan C.; and Weber, John E., 4,045,636, Cl. 200-292.000.

Box, Theodor M. Collapsible crate. 4,044,910, Cl. 220-7.000.

Boy de la Tour, Roger, to McDonnell Douglas Corporation. Cargo transfer logic circuitry. 4,045,681, Cl. 307-113.000.

Boyce, Clive B. C.: *See*—
Searle, Robert J. G.; and Boyce, Clive B. C., 4,045,575, Cl. 424-305.000.

Boyd, Dennis; and Porter, George, to Gallaher Limited. Synthetic smoking product. 4,044,777, Cl. 131-2.000.

Boyertown Burial Casket Company: *See*—
Acton, Hugh, 4,044,435, Cl. 27-2.000.

Brackney, Maurice R.: *See*—
Umpleby, Kenneth F.; and Brackney, Maurice R., 4,045,715, Cl. 351-132.000.

Bradley, James B., Jr. Ophthalmic device and method. 4,045,137, Cl. 351-132.000.

Bradshaw, John O. Timed pet food dispenser. 4,044,722, Cl. 119-51.130.

Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Molding materials based on polyvinyl chloride and polyphenylene oxide. 4,045,382, Cl. 260-4.00R.

Brand, Derek A.: *See*—
Montague, Douglas P.; Brand, Derek A.; and Morrison, Howard J., 4,044,660, Cl. 99-326.000.

Brandon, William D.: *See*—
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,045,402, Cl. 260-42.180.

Bratthall, Lars, to Stal-Laval Apparat AB. Apparatus for measuring fouling on the inside of a heat-exchanger tube. 4,044,605, Cl. 73-61.200.

Braun, Anton. Machine drive mechanism. 4,044,618, Cl. 74-29.000.

Bream, John Bernard, to Sandoz Ltd. 3-Amino-1-phenyl-1h,5h,-benzo-2,4-thiazepines. 4,045,572, Cl. 424-275.000.

Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, to Peter Smith Associates (Carpet Importers) Limited; and Collie Carpets Limited. Carpeting having stiff fibers. 4,045,605, Cl. 428-88.000.

Breslow, Jeffrey D.; Jaworski, Eugene; and Sakoda, Tom Kenzo, to Marvin Glass & Associates. Bowling alley game. 4,045,024, Cl. 273-43.00A.

Breunkink, Bernard: *See*—
Brinkman, Willem; and Breunkink, Bernard, 4,044,745, Cl. 123-139.00E.

Brewer, Charles A.; and Brewer, Richard A. Surfboard with adjustable fin. 4,044,416, Cl. 9-310.00E.

Brewer, Richard A.: *See*—
Brewer, Charles A.; and Brewer, Richard A., 4,044,416, Cl. 9-310.00E.

Bridendall, Philip R., Jr., to Olin Corporation. Connection means for anode posts in diaphragm cells. 4,045,322, Cl. 204-263.000.

Bridgestone Tire Company Limited: *See*—
Taniguchi, Motoaki; and Iwata, Toyomi, 4,044,810, Cl. 152-209.00R.

Bridigum, Robert J., to Westinghouse Air Brake Company. Dynamic blending with a spring-applied fluid pressure released service brake including cojoint spring and fluid pressure emergency feature. 4,045,093, Cl. 303-3.000.

Briggs, Warren Stanley: *See*—
Warthen, John Lawrence; Briggs, Warren Stanley; and Paggen, Marvin Vernon, 4,045,372, Cl. 252-463.000.

Brink, Andries; Stander, Adriaan Hendrikus; and Dry, Leonard James, to South African Coal, Oil & Gas Corporation Limited. Carbonaceous material. 4,045,187, Cl. 44-1.00B.

Brinkman, Willem; and Breunkink, Bernard, to Holec, N.V. Injector pump. 4,044,745, Cl. 123-139.00E.

Bristow, Stephen D., to Atari, Inc. Animated video image display system and method. 4,045,789, Cl. 340-324.0AD.

British Leyland UK Limited: *See*—
Longstaff, Kenneth, 4,044,747, Cl. 123-148.00E.

British Petroleum Company Limited, The: *See*—
Forbes, Eric Simon; and Reid, Angus Joseph Dickson, 4,045,332, Cl. 208-323.000.

Brodmann, George L.; and Schlatter, Carl Nelson, to PPG Industries, Inc. Solvent finishing of fiber glass fabrics. 4,045,601, Cl. 427-381.000.

Broerse, Pieter Hendrik: *See*—
Vrenken, Louis Eugene; and Broerse, Pieter Hendrik, 4,045,664, Cl. 240-46.030.

Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., to Lummus Company, The. Coupling process. 4,045,504, Cl. 260-669.00R.

Brouard, Claude Marie Henri Emile; and Ficht, Paulette Gisele, to Produits Chimiques Ugine Kuhlmann. Chromium complexes of phenylazopyrazolyl or phenylazonaphthol dyestuffs and acetylacetone. 4,045,423, Cl. 260-147.000.

Brown, Donald J., to Knox Manufacturing Co. Control device to position projection screen for viewing. 4,045,123, Cl. 350-117.000.

Brown, Francis Barton; and Erickson, John W., to Kobe, Inc. Centrifugal separator and system. 4,044,943, Cl. 233-19.00A.

Brown, Frank J., to United Technology, Inc. Abrasion resistant boot. 4,045,072, Cl. 294-74.000.

Brown, Ivan Richard: *See*—
Lyon, Garnet Rexford; and Brown, Ivan Richard, 4,044,650, Cl. 90-14.000.

Browne, Sidney, to Carrier Telephone Corporation of America, Inc. Continuous monitoring in carrier telephone systems. 4,045,624, Cl. 179-175.30R.

Brownell, James R.: *See*—
Carrieri, Louis F.; Brownell, James R.; Helrigel, Robert A.; Ward, Roderick K.; and Wroblewski, Jerome J., 4,044,592, Cl. 72-462.000.

Bruce, Robert J.: *See*—
Booher, Howard, 4,044,899, Cl. 214-82.000.

Bruinsma, Bote G. Short span tensile tester system. 4,044,595, Cl. 73-95.000.

Bruni, Maurice; and Seris, Georges, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude. Method for preparing fuel mixtures for torches and burners. 4,045,189, Cl. 48-190.000.

Brunnert, Stig Erik, to Saab-Scania AB. Valve mechanisms. 4,044,913, Cl. 220-86.00R.

Brutting, Eugen, to EB Sport International GmbH vormals; and Heiner Stuhfauth GmbH. Shell sole. 4,044,479, Cl. 36-32.00R.

Bryan, Clifford Chandler, to Samcoe Holding Corporation. Apparatus for processing sweater sections and the like. 4,044,434, Cl. 26-18.500.

Buchheit, Otto K., to Moeller & Neumann GmbH. Entry rollerway for a cooling bed for elongate rolled stock. 4,044,585, Cl. 72-201.000.

Buckley, Clair S. One-way brake for wheel chairs. 4,045,047, Cl. 280-242.0WC.

Budd Company, The: *See*—
Eggert, Walter S., Jr., 4,044,689, Cl. 105-221.00R.

Budnitsky, Gennady Alfeevich: *See*—
Serkov, Arkady Trofimovich; Budnitsky, Gennady Alfeevich; Sokolovsky, Boris Matveevich; and Lezhnev, Vyacheslav Kapitonovich, 4,045,532, Cl. 264-196.000.

Budoff, Hyman, to Hybud Equipment Corporation. System and method for the handling of solid waste. 4,044,664, Cl. 100-48.000.

Budrys, Vitolis: *See*—
Erickson, John W.; and Budrys, Vitolis, 4,045,145, Cl. 415-89.000.

Buerki, Christian E.: *See*—
McQueen, Raymond R., Jr.; and Buerki, Christian E., 4,045,640, Cl. 219-10.55B.

Bugarcic, Helmut, to Linke-Hofmann-Busch GmbH. Truck for the common pivotal support of two car bodies. 4,044,687, Cl. 105-4.00R.

Bugaut, Andree: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,045,170, Cl. 8-11.000.

Bulbenko, George F.; and Woodbridge, Joseph Eliot, to Princeton Biomedix Incorporated. Diagnostic method and compounds for use therewith. 4,045,290, Cl. 195-99.000.

Bumgardner, Jon H., to United States of America, Navy. Means for near real time C-W laser source characterization. 4,045,140, Cl. 356-141.000.

Bunce, Roger Abraham, to Secretary of State for Social Services. Temperature control apparatus for use in investigating specimens. 4,045,179, Cl. 23-259.000.

Bundy, Gordon L., to Upjohn Company, The. PG-type 1,15-lactones. 4,045,449, Cl. 260-340.200.

Bunnell, Edward Dennman, to AMP Incorporated. Apparatus for inserting wires into terminals in modular type connector. 4,044,451, Cl. 29-566.400.

Burd, John W.; Stone, Bobbie D.; Tucker, William F.; and Gupta, Kedar P., to Monsanto Company. Apparatus for zone refining. 4,045,181, Cl. 23-273.00R.

Burdick, Robert C. Propeller hub reflector holder. 4,045,122, Cl. 350-97.000.

Bureau de Recherches Geologiques et Minieres: *See*—
Benedetto, Alexandre; Cuvillier, Roger O.; and Gony, Jean-Noel, 4,044,956, Cl. 241-24.000.

Burg, Karlheinz: *See*—
Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, 4,045,415, Cl. 260-67.0FP.

Burgess Industries Incorporated: *See*—
Halter, Edmund John, 4,045,057, Cl. 285-49.000.

Burke, Roger A., to Hughes Aircraft Company. Watch module construction. 4,044,542, Cl. 58-23.00R.

Burkert, Walter; Hopfer, Walter; and Grasmugg, Karl, to Hilti Aktiengesellschaft. Bolt welding gun. 4,045,643, Cl. 219-98.000.

Burkhart, Merle Keith: *See*—
Schrag, Thomas Gene; Burkhart, Merle Keith; and Garrison, Harold Keith, 4,044,906, Cl. 214-506.000.

Burlingame, Richard D., to Luria Brothers & Co., Inc. High-grade metallic products. 4,044,459, Cl. 29-614.000.

Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, to Xerox Corporation. Corrugation coupled twin guide laser. 4,045,749, Cl. 331-94.50H.

Burroughs Corporation: *See*—
Gibbs, Stephen R.; and Chow, Kuen, 4,045,302, Cl. 204-15.000.
Tam, Richard K. W., 4,045,690, Cl. 307-260.000.

Burt, George A., Jr.; and Neill, William M., to International Paper Company. Machine for handling sheet material. 4,044,641, Cl. 83-341.000.

Burton, Paul F., to Dixie-Narco, Inc. Multiple column vending machine malfunction lockout circuit. 4,044,877, Cl. 194-10.000.

Buschfeld, Adolf, to Deutsche Texaco Aktiengesellschaft. Process for preparing low viscosity fatty acid-modified polyesters. 4,045,391, Cl. 260-22.0EP.

Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and by Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, to General Electric Company. Bucket-brigade delay line having reduced parasitic capacitances. 4,045,810, Cl. 357-24.000.

Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, to Jenoptik Jena G.m.b.H. III(A)-(VB) Type luminescent diode. 4,045,257, Cl. 148-171.000.

Butuzov, Alexei Vasilievich: *See*—
Titov, Dmitry Vladimirovich; Komarov, Jury Ivanovich; Butuzov, Alexei Vasilievich; and Farzaliev, Mazakhir Gamza Ogly, 4,044,801, Cl. 139-436.000.

Buxton, Jarvis Cathralle: *See*—
Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, 4,045,076, Cl. 296-39.00A.

Buzzell, Colby E., to General Electric Company. Variable reluctance speed sensor of integral construction utilizing a shielded high coercive force rare earth magnet positioned directly adjacent the sensing rotating element. 4,045,738, Cl. 324-174.000.

Byrne, Charles H., to General Foods Corporation. Interruptible time-temperature indicator. 4,044,707, Cl. 116-114.500.

Bytzek, Max: *See*—
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Bytzek, Max, 4,045,239, Cl. 106-147.000.

C. M. Systems, Incorporated: *See*—
Heffron, Allan J.; and Kennedy, Leverne H., 4,044,638, Cl. 82-9.000.

C. van der Lely N. V.: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,044,840, Cl. 172-59.000.

Cadbury Limited: *See*—
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,045,583, Cl. 426-241.000.

Caffarella, Thomas E.; Radda, George J.; and Watts, David J., to American Atomics Corporation. Method and apparatus for subdividing a gas filled glass tube. 4,045,201, Cl. 65-105.000.

Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno. Apparatus for yarn storing and feeding to yarn using machines. 4,044,962, Cl. 242-47.050.

California Institute of Technology: *See*—
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 4,045,352, Cl. 210-500.00M.

Callahan, William B.; and Coe, B. Frank, to Du Pont de Nemours, E. I., and Company. Alkyd resin manufacturing process by using water or steam to reverse or retard gelation. 4,045,392, Cl. 260-22.00R.

Camillo, Charles Carl: *See*—
Sidor, Edward Frank; Camillo, Charles Carl; and Bowen, Glenn W., 4,045,787, Cl. 340-197.000.

Campbell, Barrie C., to Billings Energy Corporation. Process of electroplating porous substrates. 4,045,303, Cl. 204-24.000.

Campbell, Duncan Paul. Nozzle. 4,044,954, Cl. 239-458.000.
Campbell, Gaylord K. Chocks. 4,044,976, Cl. 248-1.000.
Canada, Her Majesty the Queen in right of: *See*—
Hart, John A. H., 4,045,609, Cl. 428-253.000.
Canadian Patents and Development Limited: *See*—
Cox, Louis G.; and Kusters, Norbert L., 4,045,734, Cl. 324-142.000.
Canon Denshi Kabushiki Kaisha: *See*—
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.
Canon Kabushiki Kaisha: *See*—
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, 4,045,807, Cl. 354-38.000.
Momiyama, Kikuo, 4,045,128, Cl. 350-216.000.
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.
Canonica, Luigi: *See*—
Ferrari, Giorgio; Canonica, Luigi; and Danieli, Bruno, 4,045,555, Cl. 424-174.000.
Cantaluppi, Angelo, to S.A.E.S. Getters S.p.A. Silver-based catalytic composition for the oxidation of ethylene to ethylene oxide and methanol to formaldehyde. 4,045,369, Cl. 252-432.000.
Capps, Frank R.: *See*—
Strickland, James K.; Capps, Frank R.; Nekola, Todd B.; and Fremer, William A., 4,044,986, Cl. 249-216.000.
Cardarelli, John J.: *See*—
Anderson, Alan S.; and Cardarelli, John J., 4,045,670, Cl. 250-338.000.
Cares, William Ronald, to Petro-Tex Chemical Corporation. Catalyst for the depolymerization of lower polymers of isobutene. 4,045,370, Cl. 252-458.000.
Carlson, Arne, to Stal-Laval Turbin AB. Method of installation of large capacity gas-turbine powered electrical generating machinery. 4,044,442, Cl. 29-156.40R.
Carlson, Curtis Raymond, to RCA Corporation. Analog optical block processor. 4,045,133, Cl. 355-1.000.
Carlsson, Stig Ake Ingemar: *See*—
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,563, Cl. 424-263.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,564, Cl. 424-263.000.
Carnation Company: *See*—
Petrowski, Gary E.; Wolcott, John M.; and Ortiz, Erlinda P., 4,045,589, Cl. 426-609.000.
Carpenter, Robert Gordon; and Chao, Chester C., to International Business Machines Corporation. Method for composing electrical test patterns for testing AC parameters in integrated circuits. 4,045,736, Cl. 324-158.00R.
Carre, Roland, to Thomson-CSF. Band-compression device. 4,045,798, Cl. 343-17.2PC.
Carrier Corporation: *See*—
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,044,914, Cl. 220-93.000.
Liberman, Harvey W.; and Salyers, John C., 4,044,905, Cl. 214-152.000.
Carrier Telephone Corporation of America, Inc.: *See*—
Browne, Sidney, 4,045,624, Cl. 179-175.30R.
Carriere, James L. Credit card transfer assembly. 4,045,053, Cl. 282-22.00R.
Carrieri, Louis F.; Brownell, James R.; Helrigel, Robert A.; Ward, Roderick K.; and Wroblewski, Jerome J., to Gulf & Western Manufacturing Company. Coining die assembly. 4,044,592, Cl. 72-462.000.
Caruso, Albert P. Holster belt. 4,044,929, Cl. 224-2.00B.
Casio Computer Co., Ltd.: *See*—
Kashio, Toshio, 4,045,780, Cl. 364-900.000.
Cassal, Jean-Marie; Furst, Andor; and Meier, Werner, to Hoffmann-La Roche Inc. 9,10-Seco-steroid preparation. 4,045,490, Cl. 260-590.0FA.
Cassonnet, Jean-Claude Marcel: *See*—
Antoine, Pierre Gabriel; Cassonnet, Jean-Claude Marcel; and Vinot, Daniel Rene, 4,045,661, Cl. 235-153.0AC.
Castelli, Joseph T.; Forrester, Joseph J.; and Symosko, Stephen, to Instrument Services, Inc. Allpurpose portable scoreboard. 4,045,788, Cl. 340-323.00R.
Catelli, Pietro. Tubular back supported child carrier. 4,044,931, Cl. 224-6.000.
Caterpillar Tractor Co.: *See*—
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,045,402, Cl. 260-42.180.
Cruthis, Robert Duane; and Mills, Robert Samuel, 4,044,692, Cl. 105-368.00R.
Eftefield, Larry G.; and Lukavich, Paul J., 4,044,481, Cl. 37-141.00T.
Feucht, Dennis D., 4,044,977, Cl. 248-7.000.
Stedman, Robert Norris, 4,044,480, Cl. 37-8.000.
Caton, Michael Peter Lear; and Parker, Trevor, to May & Baker Limited. Cyclopentane derivatives. 4,045,467, Cl. 260-468.00D.
Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. Benzamido piperidines. 4,045,444, Cl. 260-293.580.
Cave, Ellis K., to Recognition Equipment Incorporated. Automatic corrector for fixed pattern odd/even video noise. 4,045,816, Cl. 358-212.000.
Caverly, Warren R. Sand bag filling apparatus. 4,044,921, Cl. 222-74.000.
Cavitron Corporation: *See*—
Clarke, Robert Alfred; Kuhl, Peter J.; and Paschke, Richard H., 4,045,271, Cl. 156-366.000.
Ceckler, William H.: *See*—
Meyer, Harry W., deceased; Baker, Jerry D.; and Ceckler, William H., 4,045,216, Cl. 75-84.000.
Cerutti, Bernard C.: *See*—
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.
Chai, Hi Dong; and Pawletko, Joseph Paul, to International Business Machines Corporation. Serial printer with linear motor drive. 4,044,881, Cl. 197-82.000.
Chambers, Robert V.: *See*—
Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., 4,044,806, Cl. 144-309.0AC.
Chambliss, Joni: *See*—
Linkow, Leonard I.; and Chambliss, Joni, 4,044,467, Cl. 32-10.00A.
Champion International Corporation: *See*—
Hartman, Seymour, 4,045,386, Cl. 260-17.200.
Chan, Jimmy H.: *See*—
Mihailovski, Alexander; and Chan, Jimmy H., 4,045,471, Cl. 260-471.00A.
Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Optically active alcohols and lower esters thereof. 4,045,475, Cl. 260-488.00H.
Chandramouli, Pitchaiya: *See*—
Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, 4,045,411, Cl. 260-59.00R.
Chao, Chester C.: *See*—
Carpenter, Robert Gordon; and Chao, Chester C., 4,045,736, Cl. 324-158.00R.
Charles, Steven: *See*—
McCarthy, Charles J.; Charles, Steven; and Eichenbaum, Daniel M., 4,045,630, Cl. 200-52.00R.
Chartet, Andre, to Societe Anonyme des Usines Chausson. Method for assembling tubes and tube plates and product resulting therefrom. 4,044,443, Cl. 29-157.400.
Chase Brass & Copper Co., Incorporated: *See*—
Varga, William J., 4,044,817, Cl. 164-138.000.
Chase, Willis E. Musical instrument circuit providing celeste and vibrato effects. 4,044,643, Cl. 84-1.240.
Chatelain, Lucien: *See*—
Lemonnier, Jean-Yves; and Chatelain, Lucien, 4,045,521, Cl. 261-41.00R.
Chem Systems Inc.: *See*—
Sherwin, Martin B.; and Huang, I-Der, 4,045,477, Cl. 260-497.00R.
Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich. Apparatus for continuous vacuum-refining of metals. 4,045,006, Cl. 266-149.000.
Chevron Research Company: *See*—
Reed, Marion G., 4,045,357, Cl. 252-8.50A.
Simic, Milutin; and Sweeney, William A., 4,045,506, Cl. 260-677.00A.
Cheyka, Lyudmila Karlo: *See*—
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.
Chiang, Bing; and Hoyte, Alfred F. Continuous flow heat treating apparatus using microwaves. 4,045,638, Cl. 219-10.55A.
Chicago Pneumatic Tool Company: *See*—
D'Haem, Marcel P.; and Axt, Wallis C., 4,044,625, Cl. 74-558.500.
Chiu, Richard H.: *See*—
Stavovy, Alexander B.; and Chiu, Richard H., 4,044,598, Cl. 73-7.000.
Chiu, Shui-Tung; and Turko, William Melvin, to Borden Chemical Company (Canada) Limited, The. Coating wood surface by vinyl-modified lignocellulosic particles. 4,045,595, Cl. 427-202.000.
Chopdekar, Vilas M.; and Davis, William R., to M&T Chemicals Inc. Method for preparing triogranophosphines. 4,045,494, Cl. 260-606.5QP.
Chore-Time Equipment, Inc.: *See*—
Swartzendruber, Ray E., 4,044,920, Cl. 222-58.000.
Chow, Kuen: *See*—
Gibbs, Stephen R.; and Chow, Kuen, 4,045,302, Cl. 204-15.000.
Christiansen, Soren Bent, to F. L. Smidth & Co. Method of burning granular or pulverulent raw material and kiln plant therefor. 4,045,162, Cl. 432-14.000.
Christman, Robert D.: *See*—
Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., 4,045,182, Cl. 23-288.00R.
Chromax Limited: *See*—
Jackson, John Maxwell, 4,044,667, Cl. 101-38.00R.
Chrysler United Kingdom Limited: *See*—
Stringer, Roy Ernest, 4,045,666, Cl. 240-61.800.
Chu, Gordon P. K.; Shinn, Dennis B.; and Waymouth, John F., to GTE Sylvania Incorporated. Photoflash lamp. 4,045,156, Cl. 431-95.00R.
Chumaevskaya, Alla Nikolaevna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr

Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Ciba-Geigy Corporation: *See*—
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 4,045,570, Cl. 424-275.000.
Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, 4,045,459, Cl. 260-448.80R.
Gosteli, Jacques, 4,045,520, Cl. 260-985.000.
Stephen, John F., 4,045,404, Cl. 260-45.80N.
Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, 4,045,580, Cl. 424-330.000.
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,045,518, Cl. 260-927.00R.

Cincinnati Milacron Inc.: *See*—
Kelly, Ralph; and Ritter, Edmond Jean, 4,045,550, Cl. 424-70.000.
Weisgerber, William Robert; and Taylor, Ralph Charles, 4,045,660, Cl. 235-151.110.

Cini, Carlo; Murari, Bruno; and Santi, Mario, to SGS-ATES Componenti Elettronici S.p.A. Low-frequency power amplifier. 4,045,745, Cl. 330-15.000.

City Tank Corporation: *See*—
McKenzie, Roland W., 4,044,791, Cl. 137-493.900.

Clabburn, Robin J. T., to Raychem Limited. Recoverable article with outwardly extending hollow heat flanges; kit including such article and a cylindrical substrate; and method of making such article. 4,045,604, Cl. 428-36.000.

Claisse, Fernand. Fusion and casting machine. 4,045,202, Cl. 65-178.000.

Clark, Kenneth M., to Deutsch Company Electronic Components Division, The. Optical fiber connector. 4,045,121, Cl. 350-96.00C.

Clarke, John Michael. Reciprocating piston machine. 4,044,629, Cl. 74-579.00E.

Clarke, Robert Alfred; Kuhl, Peter J.; and Paschke, Richard H., to Cavitron Corporation. Ultrasonic method and apparatus for manufacturing brassiere tapes. 4,045,271, Cl. 156-366.000.

Claxton, William E.; and Holden, Harold C., to Firestone Tire & Rubber Company, The. Tire cure and heat transfer simulator. 4,044,600, Cl. 73-15.00R.

Clayton Manufacturing Company: *See*—
Asmus, Carl J., 4,044,609, Cl. 73-117.000.

Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. 1-Dimethylamino-2,4-diphenyl-1-butene-3,4-dione. 4,045,487, Cl. 260-570.50C.

Clemence, Francois; and Le Martret, Odile, to Roussel Uclaf. 2-Alkyl-5-thiazole-carboxylic acid derivatives in hypolipemiant compositions. 4,045,567, Cl. 424-270.000.

Cless, Gerhard; and Kaplan, Edward L., to Extel Corporation. Tape punch machine. 4,044,946, Cl. 234-39.000.

Clinton, Daniel J.: *See*—
Shine, Alfred C., 4,045,078, Cl. 269-324.000.

Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, to Sandoz Ltd. 2,3-Dihydrobenzofuran-2-one derivatives. 4,045,573, Cl. 424-279.000.

Coal Industry (Patents) Limited: *See*—
Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, 4,045,380, Cl. 260-2.5HA.
Monks, Harry, 4,045,083, Cl. 299-1.000.

Coberly, Charles Wheeler. Integrated circuit probe. 4,045,737, Cl. 324-158.00P.

Cockshott, Ian Derek: *See*—
Martin, Graham Ernest; Cockshott, Ian Derek; and Fildes, Francis James Thomas, 4,044,404, Cl. 3-19.000.

Coe, B. Frank: *See*—
Callahan, William B.; and Coe, B. Frank, 4,045,392, Cl. 260-22.00R.

Cohen, Arnold, to Jones & Vining, Incorporated. Molding footwear lasts. 4,044,417, Cl. 12-146.00L.

Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Steroid total synthesis process utilizing a cyanoalkyl A-ring precursor. 4,045,452, Cl. 260-345.90S.

Cohn, Charles C. Cigarettes. 4,044,778, Cl. 131-4.00A.

Coleman, Joe E.: *See*—
Jessup, Robert L.; and Coleman, Joe E., 4,044,829, Cl. 166-264.000.

Coleman, Michael G.; and Pryor, Robert A., to Motorola, Inc. Solar cell package. 4,045,245, Cl. 136-89.00C.

Colgate-Palmolive Company: *See*—
Gerecht, John Fred, 4,045,549, Cl. 424-60.000.
Ramachandran, Pallassana, 4,045,358, Cl. 252-8.600.

Colin, Dennis P.: *See*—
Pearlman, Alan R.; and Colin, Dennis P., 4,044,642, Cl. 84-1.100.

Collie Carpets Limited: *See*—
Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, 4,045,605, Cl. 428-88.000.

Collins, Robert Lee: *See*—
Gaumont, Richard J.; Wolfe, Maurice Leonard; and Collins, Robert Lee, 4,044,900, Cl. 214-86.00A.

Combustion Engineering, Inc.: *See*—
Noyes, Richard Croissant; Dupen, Clive Frederick George; Barrus, Donald Martin; and Siegel, Edward Arnold, 4,045,283, Cl. 176-35.000.
Seaton, William Wayne, 4,044,927, Cl. 222-604.000.

Combustion Research Corporation: *See*—
Johnson, Arthur C. W., 4,044,751, Cl. 126-91.00A.

Commissariat a l'Energie Atomique: *See*—
Barbier, Georges, 4,045,282, Cl. 176-19.00R.
Gugenberger, Rene; and Martin, Roger, 4,044,825, Cl. 165-165.000.

Compagnie Francaise des Petroles: *See*—
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.

Compagnie Generale Pour Les Developpements Operationnels: *See*—
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.

Compagnie Honeywell Bull (Societe Anonyme): *See*—
Antoine, Pierre Gabriel; Cassonnet, Jean-Claude Marcel; and Vinot, Daniel Rene, 4,045,661, Cl. 235-153.0AC.

Compagnie Industrielle des Telecommunications CIT-ALCATEL S.A.: *See*—
Lagarde, Jean-Louis; and Gauriat, Gilles, 4,045,618, Cl. 179-15.0BS.

Compagnie Maritime D'Expertises: *See*—
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.

Conner, William R., Jr., to Stahl-Urban Company. Apparatus for joining plies of material such as textile fabric. 4,044,698, Cl. 112-121.120.

Connor, David T.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 2-(Methylthio)naphtho[1,3-bc]pyran-3(2H)-one. 4,045,451, Cl. 260-345.200.

Conrac Corporation: *See*—
Westbrook, James E., 4,045,620, Cl. 179-84.0VF.

Consolidated Controls Corporation: *See*—
Jukoff, David, 4,044,992, Cl. 251-126.000.
Waller, Henry A., 4,044,991, Cl. 251-122.000.

Container Corporation of America: *See*—
Helms, C. R., 4,044,940, Cl. 229-40.000.

Contois, Lawrence E.; Fox, Charles J.; and Stahr, Richard W., to Eastman Kodak Company. Low color photoconductive insulating compositions comprising nitrogen-free photoconductor and benzopyrilium sensitizer. 4,045,220, Cl. 96-1.600.

Convent, Bernard, to Monsanto Company. Synergistic herbicidal composition comprising N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and methabenzthiazuron. 4,045,206, Cl. 71-90.000.

Convent, Bernard, to Monsanto Company. Synergistic herbicidal composition comprising N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and pyrazon. 4,045,207, Cl. 71-92.000.

Convent, Bernard, to Monsanto Company. Synergistic herbicidal composition comprising N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and N-(3-chloro-4-methyl phenyl)-N',N'-dimethylurea. 4,045,210, Cl. 71-120.000.

Cooksley, Ralph D. Water purification apparatus and method. 4,045,293, Cl. 203-10.000.

Coombs, Donald L.; and Hollis, Richard E., to International Telephone and Telegraph Corporation. Burner assembly. 4,045,158, Cl. 431-123.000.

Cor Tech Research Limited: *See*—
Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, 4,045,411, Cl. 260-59.00R.

Corbin, Terry; and Zytkovicz, Duane J., to Medtronic, Inc. Percutaneously inserted spinal cord stimulation lead. 4,044,774, Cl. 128-404.000.

Cornell Research Foundation, Inc.: *See*—
Humphries, Stanley, Jr.; and Sudan, Ravindra N., 4,045,677, Cl. 250-423.00R.

Corrigan, Francis R., to General Electric Company. Method for producing large soft hexagonal boron nitride particles. 4,045,186, Cl. 23-295.00R.

Coster, Theo M. S. Marker board. 4,045,013, Cl. 273-136.00F.

Cottingham, James G., to United States of America, Energy Research and Development Administration. Hydride heat pump. 4,044,819, Cl. 165-1.000.

Cox, Fred L.; Crump, Steve; and Hice, Phate, to Silver Creek Minerals Corporation. Method and apparatus for stripping, cleaning and treating surfaces. 4,044,507, Cl. 51-424.000.

Cox, John William Andrew, to Macleisure Limited. Games practice net and protectve screen. 4,045,032, Cl. 273-181.00F.

Cox, Louis G.; and Kusters, Norbert L., to Canadian Patents and Development Limited. Differential thermal wattmeter. 4,045,734, Cl. 324-142.000.

Coyer, Robert G.: *See*—
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.

Craft, Carl R. Hay handler. 4,044,907, Cl. 214-506.000.

Crankshaft Machine Company: *See*—
Heffron, Allan J.; and Kennedy, Leverne H., 4,044,638, Cl. 82-9.000.

Crask, Geoffrey J., to Hydril Company. Tilt detector and system. 4,044,473, Cl. 33-333.000.

Crawford, Edward N., to ACF Industries, Incorporated. Diaphragm actuated valves. 4,044,788, Cl. 137-117.000.

Creusot-Loire: *See*—
Abrial, Lucien, 4,045,168, Cl. 432-247.000.
Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, 4,045,213, Cl. 75-48.000.
Leroy, Pierre; Morlet, Jean Georges; and Saleil, Jean, 4,045,215, Cl. 75-82.000.

Crimi, Peter, to Avco Corporation. Helicopter rotor blade. 4,045,146, Cl. 416-1.000.

Cronin, Paul W.; Ottmar, Peter H.; Root, Ernest F.; and Simmons, Harry M., to Itek Corporation. Solar collector autonatic freeze protection system. 4,044,754, Cl. 126-271.000.

Crowe, Talmadge L., to Baker International Corporation. Retrievable well packers. 4,044,826, Cl. 166-120.000.

Crump, Steve: *See*—
Cox, Fred L.; Crump, Steve; and Hice, Phate, 4,044,507, Cl. 51-424.000.

Cruthis, Robert Duane; and Mills, Robert Samuel, to Caterpillar Tractor Co. Railroad car vehicle stowing device. 4,044,692, Cl. 105-368.00R.

CSE Corporation: *See*—
McNally, Frank X., 4,045,177, Cl. 23-254.00E.

Cummins Enterprises: *See*—
Cummins, Victor, 4,044,980, Cl. 248-13.000.

Cummins, Victor, to Cummins Enterprises. Collapsible desktop stand for portable electronic calculator. 4,044,980, Cl. 248-13.000.

Cunningham, Hugh, to PPG Industries, Inc. Cell liquor emission control. 4,045,324, Cl. 204-268.000.

Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, to Gulf Research & Development Company. Method of oligomerizing 1-olefins. 4,045,507, Cl. 260-683.15B.

Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, to Gulf Research & Development Company. Method of making alpha-olefin oligomers. 4,045,508, Cl. 260-683.15B.

Curp, Russell W., to SSP Agricultural Equipment, Inc. Tiltable wind machine for use on variable terrain. 4,045,147, Cl. 416-100.000.

Curtis, Gerald B.: *See*—
Moore, Robert J.; and Curtis, Gerald B., 4,045,263, Cl. 156-64.000.

Cutler, Royal A.; and Schalit, Samuel, to Sterling Drug Inc. Amidinoureas and amidinothioureas. 4,045,483, Cl. 260-552.00R.

Cuvillier, Roger O.: *See*—
Benedetto, Alexandre; Cuvillier, Roger O.; and Gony, Jean-Noel, 4,044,956, Cl. 241-24.000.

Cycles-Peugeot: *See*—
Fourrey, Francois, 4,045,043, Cl. 280-79.300.

D. B. A.: *See*—
Guillon, Marcel F., 4,044,654, Cl. 91-499.000.

Daffner, Erich; and Sarnezki, Herbert, to Siemens Aktiengesellschaft. Arrangement having a traveling-wave tube and a current supply unit. 4,045,706, Cl. 315-3.500.

Dahms, Ronald H., to Monsanto Company. Resole resin binder composition. 4,045,398, Cl. 260-29.300.

Dai Nippon Printing Co., Ltd : *See*—
Satoshi, Takeuchi, 4,045,312, Cl. 204-129.650.

Daicel Ltd.: *See*—
Ishii, Masaichi; and Mihara, Kazuo, 4,044,418, Cl. 15-104.06A.

Daigle Aqua Inc.: *See*—
Daigle, Rosaire, 4,045,060, Cl. 285-369.000.

Daigle, Rosaire, to Daigle Aqua Inc. Pipe retainer joints. 4,045,060, Cl. 285-369.000.

Daimler-Benz Aktiengesellschaft: *See*—
Florus, Hans-Jorg; Grossner, Horst; and Weiger, Gunter, 4,044,634, Cl. 74-866.000.
Wilfert, Karl; Schmid, Walter; and Jambor, Arno, 4,045,052, Cl. 280-701.000.
Worner, Gunter, 4,044,874, Cl. 192-106.200.

Daimon, Nobutoshi; and Izawa, Toichiro. Synthetic taeniolite and process of producing the same. 4,045,241, Cl. 106-306.000.

Danieli, Bruno: *See*—
Ferrari, Giorgio; Canonica, Luigi; and Danieli, Bruno, 4,045,555, Cl. 424-174.000.

Danieliants, Armais Avakovich: *See*—
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.

Danielsson, Hans: *See*—
Ekholm, Rolf; and Danielsson, Hans, 4,044,893, Cl. 214-1.0PB.

Dann, Daryl L., to Midland-Ross Corporation. Touch-sensitive door control switch. 4,045,631, Cl. 200-61.430.

Danon, Joseph S.: *See*—
Wolfe, Denis G.; and Danon, Joseph S., 4,045,155, Cl. 431-42.000.

Danyel S.A.S.: *See*—
Invernati, Carlo, 4,044,646, Cl. 84-435.000.

Dapiran, Fulvio, to U.S. Philips Corporation. Radio locating unit for persons in distress. 4,045,799, Cl. 343-113.0PT.

Dart Industries Inc.: *See*—
Korenowski, Theodore Frank; Penland, Jerry Lee; and Ritzert, Chalmer John, 4,045,339, Cl. 210-45.000.
Lancy, Leslie Emery, 4,045,171, Cl. 8-74.000.

Dat-Xuong, Nguyen: *See*—
Le Pecq, Jean Bernard; Paoletti, Claude; and Dat-Xuong, Nguyen, 4,045,565, Cl. 424-263.000.

Data Recording Instrument Company Limited: *See*—
Walker, Keith Francis, 4,045,743, Cl. 328-150.000.

Dauberger, George R., to Midland-Ross Corporation. Cover for electrical floor boxes. 4,044,908, Cl. 220-3.800.

Dauten S.A.: *See*—
Ferrari, Giorgio; Canonica, Luigi; and Danieli, Bruno, 4,045,555, Cl. 424-174.000.

Davidson, Albin A.: *See*—
Owens, William T.; Davidson, Albin A.; and Nelson, Eldrid W., 4,044,594, Cl. 73-67.80S.

Davidson, Charles Patrick Duncan: *See*—
Lewis, Frank; and Davidson, Charles Patrick Duncan, 4,044,852, Cl. 180-68.500.
Shaw, Leslie Thomas; and Davidson, Charles Patrick Duncan, 4,044,851, Cl. 180-33.00C.

Davidson, Donald H.: *See*—
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,045,084, Cl. 299-4.000.

Davis, Bernard H.; Mack, Rollin T.; and Miyasaki, Kenneth, to H. H. Robertson Company. Method and apparatus for tacking a honeycomb core to a base sheet. 4,045,267, Cl. 156-197.000.

Davis, Dwight E.; and Foster, Stephen J., to General Atomic Company. Blending device. 4,045,005, Cl. 259-36.000.

Davis, Larry: *See*—
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,045,448, Cl. 260-326.50B.

Davis, William R.: *See*—
Chopdekar, Vilas M.; and Davis, William R., 4,045,494, Cl. 260-606.50P.

Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, to Portland Wire & Iron Works. System for removably securing sound-proofing material to a construction vehicle. 4,045,076, Cl. 296-39.00A.

Day, Ray E.: *See*—
Day, Stanley R.; and Day, Ray E., 4,044,534, Cl. 56-13.300.

Day, Stanley R.; and Day, Ray E. Lawn mower. 4,044,534, Cl. 56-13.300.

De Limon Fluhme & Co.: *See*—
Saretzky, Horst, 4,044,924, Cl. 222-250.000.

Deal, Clarence D., to Electromeasures, Inc. Grain moisture measurement probe. 4,044,607, Cl. 73-73.000.

Debolt, Harold E., to Avco Corporation. Process for modifying amorphous carbon filaments. 4,045,597, Cl. 427-248.00A.

Decel Corporation: *See*—
Appleman, Milo D.; and DeSantis, Stanislao A., 4,045,585, Cl. 426-331.000.

Dechelette, Helen, to AMP Incorporated. Method of manufacturing an electrical connector. 4,045,114, Cl. 339-210.00M.

de Corlieu, Guy; and Reymond, Jean-Claude, to Thomson-CSF. Coupler for optical communication system. 4,045,120, Cl. 350-96.00C.

Deeks, Ronald George. Railway tank hopper car. 4,044,690, Cl. 105-247.000.

Deere & Company: *See*—
Dodd, Wesley Lamar, 4,044,804, Cl. 144-34.00E.
Haverdink, Virgil Dean, 4,044,837, Cl. 171-58.000.

Defives, Daniel: *See*—
Avrillon, Rene; and Defives, Daniel, 4,045,330, Cl. 208-180.000.

Deguchi, Akio, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for toughening treatment of metallic material. 4,045,254, Cl. 148-12.00R.

De Haan, Maarten Rutger: *See*—
Verhoeven, Leonardus Adrianus Johannes; De Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, 4,045,812, Cl. 358-4.000.

Deike, Robert F., to Foresight Industries. Earth anchor. 4,044,513, Cl. 52-163.000.

Deisting, Horst, to Adrema Pitney Bowes GmbH. Printing device having a sliding carriage. 4,044,675, Cl. 101-269.000.

Dekker, Donald Allen, to Attwood Corporation. Boat steering wheel. 4,044,624, Cl. 74-552.000.

Del Guercio, Louis R. M.: *See*—
Szabo, Anthony W.; and Del Guercio, Louis R. M., 4,044,764, Cl. 128-214.00F.

Delta Plastics Limited: *See*—
Kuhne, Kurt Anton; and Wassilieff, Alexander, 4,044,665, Cl. 101-21.000.

de Mere, Henri Edouard Courier, to Bicosa Societe de Recherches. Control circuit for the conduction of an electronic switch. 4,044,681, Cl. 102-70.20R.

Demmin, Timothy R.: *See*—
Rogic, Milorad M.; Swerdloff, Michael D.; and Demmin, Timothy R., 4,045,422, Cl. 260-143.000.

Demoute, Jean-Pierre: *See*—
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,045,209, Cl. 71-98.000.

Deno, Norman C., to Fats and Proteins Research Foundation, Inc. Method of hydroxylation. 4,045,498, Cl. 260-617.00R.

Deportes, Charles Henri; Henault, Marc Patrice Sylvain; Tasset, Francis; and Vitter, Gerard Raymond Robert, to Agence Nationale de Valorisation de la Recherche (ANVAR). Electrochemical gage for measuring partial pressures of oxygen. 4,045,319, Cl. 204-195.00S.

D'Errico, Joseph, to Howmedica, Inc. Implantable joint prosthesis. 4,044,403, Cl. 3-1.913.

Desai, Nitin Vithalbhai: *See*—
Himics, Richard Joseph; Desai, Nitin Vithalbhai; and Poliniak, Eugene Samuel, 4,045,318, Cl. 204-192.00E.

DeSantis, Stanislao A.: *See*—
Appleman, Milo D.; and DeSantis, Stanislao A., 4,045,585, Cl. 426-331.000.

DeSoto, Inc.: *See*—
Aeschliman, Eugene, 4,044,700, Cl. 112-217.100.

DeTommasi, Arthur N., to General Electric Company. Voltage responsive switches and methods of making. 4,045,712, Cl. 315-323.000.

Deutsch Company Electronic Components Division, The: *See*—
Clark, Kenneth M., 4,045,121, Cl. 350-96.00C.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Asinger, Friedrich; Offermanns, Heribert; and Gulzek, Karl-Heinz, 4,045,479, Cl. 260-534.00S.

Deutsche Texaco Aktiengesellschaft: *See*—
Buschfeld, Adolf, 4,045,391, Cl. 260-22.0EP.

de Versterre, William I.: *See*—
Worden, Donald A.; de Versterre, William I.; and Petry, Henry Alfred, 4,044,580, Cl. 72-21.000.

DeVitto, Ronald Robert: *See*—
Raudys, Vytas Andrew; and DeVitto, Ronald Robert, 4,044,450, Cl. 29-509.000.

DeVone, James Milton. Convertra-bike top. 4,045,077, Cl. 296-78.100.
DewEze Mfg., Inc.: *See*—
Hostetler, Dewey L., 4,044,963, Cl. 242-54.00R.
D'Haem, Marcel P.; and Axt, Wallis C., to Chicago Pneumatic Tool Company. Vibration isolating hand grip for shank of a percussive chisel. 4,044,625, Cl. 74-558.500.
Digital Equipment Corporation: *See*—
Levy, John V.; Northrup, Thomas A.; and Giggi, Robert, 4,045,781, Cl. 364-200.000.
Dille, Roger M.; Van Stavern, Merle H.; Shull, Don L.; and Gripshover, David F., to Texaco Inc. Method and apparatus for continuously monitoring the presence of oil in water. 4,045,671, Cl. 250-341.000.
Dingwall, Andrew Gordon Francis, to RCA Corporation. Method of making a semiconductor device. 4,045,250, Cl. 148-1.500.
Dingwall, Andrew Gordon Francis, to RCA Corporation. Semiconductor integrated circuit device including an array of insulated gate field effect transistors. 4,045,811, Cl. 357-41.000.
Disosway, Mark D., III; and Sheldrake, Leonard J., to General Motors Corporation. Electric cranking motor automatic disconnect and lockout circuit. 4,045,062, Cl. 290-38.00R.
Dix, Robert M.; Tobias, Samuel F.; and Whicker, Stephen L., to Texas Instruments Incorporated. Modular, magnetically-coupled drive for a cryogenic refrigerator. 4,044,567, Cl. 62-6.000.
Dixie-Narco, Inc.: *See*—
Burton, Paul F., 4,044,877, Cl. 194-10.000.
Doane, William M.: *See*—
Fanta, George F.; and Doane, William M., 4,045,387, Cl. 260-17.4GC.
Dockerty, Robert Charles: *See*—
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,044,452, Cl. 29-571.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Dorsch, Heinz; and Weber, Julius, 4,044,560, Cl. 60-601.000.
Dodd, Wesley Lamar, to Deere & Company. Tree shearer. 4,044,804, Cl. 144-34.00E.
Dodgen Industries, Inc.: *See*—
Dodgen, John N., 4,044,999, Cl. 254-45.000.
Dodgen, John N., to Dodgen Industries, Inc. Camper jack. 4,044,999, Cl. 254-45.000.
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus with retractable image transfer roller means. 4,045,135, Cl. 355-11.000.
Dolan, Jerome J.; and Rosenberger, Roy R., to Nalco Chemical Company. Multiplex circuit with time delay for stabilization. 4,045,733, Cl. 324-140.00R.
DoMinh, Thap, to Eastman Kodak Company. Process of amplifying image in image recording layer by releasing reactant from image forming layer containing cobalt(III)complex. 4,045,221, Cl. 96-29.00R.
Donaher, Charles Joseph: *See*—
Lee, James C. K.; and Donaher, Charles Joseph, 4,045,105, Cl. 339-17.0CF.
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, to Ciba-Geigy Corporation. Heterocyclic S-imino-S-oxides. 4,045,570, Cl. 424-275.000.
Dorman, Linneaus C., to Dow Chemical Company, The. Method for forming an amide bond between a latex and protein. 4,045,384, Cl. 260-8.000.
Dorsch, Heinz; and Weber, Julius, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Air pressure regulator arrangement for an internal combustion. 4,044,560, Cl. 60-601.000.
Doss, Rainer: *See*—
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.
Double Envelope Corporation: *See*—
Sherwood, Jack Edward, 4,044,942, Cl. 229-73.000.
Doucet, Laurent. Attachment for offset duplicating machine. 4,044,666, Cl. 101-76.000.
Dougherty, Lawrence W., to Zenith Radio Corporation. Shadow mask supported by cathode ray tube faceplate. 4,045,701, Cl. 313-408.000.
Douri, Hisashi, to Yoshida Kogyo Kabushiki Kaisha. Apparatus for attaching end stops to fastener stringers with a safety stop function. 4,044,445, Cl. 29-706.000.
Douros, John D., Jr.; and Warder, Ira T., Jr., to Gates Rubber Company, The. Beneficiation of uric acid from natural products. 4,045,582, Cl. 426-69.000.
Dow Chemical Company, The: *See*—
Dorman, Linneaus C., 4,045,384, Cl. 260-8.000.
Hurst, Robert E.; and Lunsford, Charles L., 4,044,563, Cl. 61-35.000.
Plepys, Raymond A., 4,045,410, Cl. 260-52.000.
Swearingen, Charles C.; and Sheptak, Nicholas, 4,045,607, Cl. 428-200.000.
Dragerwerk Aktiengesellschaft: *See*—
Eckstein, Wolfgang; and Benthin, Frank, 4,045,192, Cl. 55-222.000.
Drawert, Manfred; Griebsch, Eugen; and Imoehl, Wolfgang, to Schering Aktiengesellschaft. Method of adhering textiles with a polyamide melt adhesive. 4,045,389, Cl. 260-18.00N.
Dressel, Brent W.: *See*—
Soper, LaVern G.; and Dressel, Brent W., 4,045,653, Cl. 219-438.000.
Dresser Industries, Inc.: *See*—
Lichte, Carl Laurent, 4,045,646, Cl. 219-121.0EB.
Driscoll, John J. Electrode holder. 4,045,642, Cl. 219-70.000.
Drori, Mordeki. Self-flushing filter. 4,045,345, Cl. 210-107.000.
Drummond, Warren W., to PPG Industries, Inc. Method of preparing glass strand and novel glass strand packages. 4,045,195, Cl. 65-2.000.
Dry, Leonard James: *See*—
Brink, Andries; Stander, Adriaan Hendrikus; and Dry, Leonard James, 4,045,187, Cl. 44-1.00B.
DSO "Stara Planina": *See*—
Urmanov, Urman Alexandrov, 4,045,528, Cl. 264-69.000.
Dubell, Robert L.: *See*—
Green, Robert C.; and Dubell, Robert L., 4,045,328, Cl. 208-8.000.
Dudek, Thomas J.; Marker, Leon F.; and Janssen, Hendrik Jan Jacob, to General Tire & Rubber Company, The. Laminated pneumatic tire. 4,044,811, Cl. 152-354.000.
Dufrene, Alex. Collar locating apparatus. 4,044,470, Cl. 33-125.00R.
dun-Rite Erectors, Inc.: *See*—
Pynsky, Raymond F., 4,044,891, Cl. 209-73.000.
Duncan, John J.; and Kirjanov, Alexander, to GAF Corporation. Textile soil release composition and method. 4,045,172, Cl. 8-115.700.
Dunstan, James W., to Acorn Building Components, Inc. System for transporting and storing long extrusions. 4,045,071, Cl. 294-67.00R.
Dupen, Clive Frederick George: *See*—
Noyes, Richard Croissant; Dupen, Clive Frederick George; Barrus, Donald Martin; and Siegel, Edward Arnold, 4,045,283, Cl. 176-35.000.
duPont, Anthony A. Process for the preparation of hydrogen. 4,045,546, Cl. 423-657.000.
Du Pont de Nemours, E. I., and Company: *See*—
Callahan, William B.; and Coe, B. Frank, 4,045,392, Cl. 260-22.00R.
Fuchs, Julius Jakob, 4,045,473, Cl. 260-482.00C.
Hunter, Frank Ray, 4,045,425, Cl. 260-163.000.
Nazarenko, Nicholas; and Seidel, William Carl, 4,045,495, Cl. 260-606.50B.
Williston, David Wyckoff; Bancroft, Lewis Clinton; and Hiller, Dale Murray, 4,045,544, Cl. 423-607.000.
Durable Packaging Corporation: *See*—
Ulrich, Lawrence Walter; and Walker, Connie Wayne, 4,044,527, Cl. 53-137.000.
Durichen, Klaus: *See*—
Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, 4,045,415, Cl. 260-67.0FP.
Duros, James M.: *See*—
Peltola, Veikko K.; and Duros, James M., 4,045,658, Cl. 235-151.300.
Duval Corporation: *See*—
Adams, Ben E.; and Gidak, Edward J., Jr., 4,045,335, Cl. 209-166.000.
Dwivedi, Basant K.: *See*—
Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, 4,045,581, Cl. 426-3.000.
Dyess, Lonnie V. Game target with adjustable pins. 4,045,028, Cl. 273-104.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Klein, Gerd; and Schmoll, Kurt, 4,045,385, Cl. 260-15.000.
E-H Research Laboratories, Inc.: *See*—
Worcester, John L.; and Hubbs, John C., 4,045,735, Cl. 324-158.00F.
E. I. Du Ponte de Nemours and Company: *See*—
Uyeda, Roy Teruyuki, 4,045,432, Cl. 260-239.00B.
Eads, William Donovan; and Maitland, David Steven, to Hewlett-Packard Company. Information transfer bus circuit with signal loss compensation. 4,045,684, Cl. 307-200.00B.
Earth Chemical Company, Limited: *See*—
Nishimura, Akira; Akamatsu, Hiroshi; Negoro, Sentaro; and Yoshida, Yasutoshi, 4,044,495, Cl. 43-121.000.
Eastgate, Harold F., to Laser Bioapplications. Flexible laser waveguide. 4,045,119, Cl. 350-96.0LM.
Eastman Kodak Company: *See*—
Bianchi, Thomas A., 4,045,501, Cl. 260-651.00R.
Contois, Lawrence E.; Fox, Charles J.; and Stahr, Richard W., 4,045,220, Cl. 96-1.600.
DoMinh, Thap, 4,045,221, Cl. 96-29.00R.
Fagerburg, David R., 4,045,431, Cl. 260-22.00D.
Phillips, Bobby M.; and Gregory, Dale R., 4,045,529, Cl. 264-75.000.
Weber, Wayne Woodrow, II; and Heseltine, Donald Warren, 4,045,229, Cl. 96-84.0UV.
Eaton, Bryan, to Fram Corporation. Cannister purge valve assembly. 4,044,743, Cl. 123-136.000.
Eaton Corporation: *See*—
Yip, James K., 4,044,786, Cl. 137-101.000.
EB Sport International GmbH vormals: *See*—
Brutting, Eugen, 4,044,479, Cl. 36-32.00R.
Ebata, Hiroyuki, to Yoshida Kogyo Kabushiki Kaisha. Net jointing structure. 4,044,432, Cl. 24-205.16R.
Ebenstein, Ruth B. Resilient hand loom grid. 4,044,437, Cl. 28-151.000.
Eberhardt, Roland C.: *See*—
Taylor, Gary Burton; and Eberhardt, Roland C., 4,045,046, Cl. 280-87.04A.
Echlin Manufacturing Company, The: *See*—
Klimek, Boleslaw M., 4,045,768, Cl. 340-52.00C.
Eckstein, Wolfgang; and Benthin, Frank, to Dragerwerk Aktiengesellschaft. Mobile filtering apparatus for keeping patients under aseptic conditions. 4,045,192, Cl. 55-222.000.
Econo-Therm Energy Systems Corporation: *See*—
Nobles, Elon J., 4,044,820, Cl. 165-2.000.

Edwards, Kenneth L.: *See—*
White, Russell L.; and Edwards, Kenneth L., 4,045,308, Cl. 204-67.000.
Edwards, Nigel, to National Research Development Corporation. Laryngeal prosthesis. 4,044,402, Cl. 3-1.300.
Edwards, Ralph R.: *See—*
McCluskey, John R.; and Edwards, Ralph R., 4,045,003, Cl. 256-59.000.
Edwards, Roger Alan: *See—*
Baylis, Howard Raymond; and Edwards, Roger Alan, 4,045,803, Cl. 354-5.000.
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, to American Hoechst Corporation. Pyrrolo[2,1-c][1,4]benzoxazepine and benzoxazocine derivatives. 4,045,448, Cl. 260-326.50B.
Eftefield, Larry G.; and Lukavich, Paul J., to Caterpillar Tractor Co. Reversible blade bit. 4,044,481, Cl. 37-141.00T.
Egert, Allen C.; Koutsky, L. John; and Ropp, Dale R., to Sears Manufacturing Co. Seat having back rest with different pivots for tilting and for folding level. 4,045,082, Cl. 297-357.000.
Eggert, Walter S., Jr., to Budd Company, The. Resiliently railway truck suspension. 4,044,689, Cl. 105-221.00R.
Eichenbaum, Daniel M.: *See—*
McCarthy, Charles J.; Charles, Steven; and Eichenbaum, Daniel M., 4,045,630, Cl. 200-52.00R.
Eide, Svein, to A/S Ardal og Sunndal Verk. Electric hotplate with thermostat. 4,045,654, Cl. 219-449.000.
Eilingsfeld, Heinz: *See—*
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.
Eiring, Karl: *See—*
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, 4,045,161, Cl. 432-80.000.
Eisner, Steve; and Powell, James LeRoy, to Boeing Company, The. Fracturing agent. 4,045,356, Cl. 225-2.000.
Eitel, Jay M., to General Cable Corporation. Aerial lifting equipment. 4,044,902, Cl. 214-132.000.
Ekholm, Rolf; and Danielsson, Hans, to AB Hammars Mekaniska Verkstad. Device for lifting pieces of lumber. 4,044,893, Cl. 214-1.0PB.
Ela, Roger B.: *See—*
McDonald, Donald C.; Ela, Roger B.; and Whittaker, Francis E., 4,044,894, Cl. 214-1.0QD.
Elco Corporation, The: *See—*
Lee, Donald A.; and Korosec, Philip S., 4,045,363, Cl. 252-49.500.
Elder, Decker Kuykendall: *See—*
Taller, Robert Arthur; and Elder, Decker Kuykendall, 4,045,474, Cl. 260-484.00A.
Electricite de France (Service National): *See—*
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Electromeasures, Inc.: *See—*
Deal, Clarence D., 4,044,607, Cl. 73-73.000.
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Tezuka, Junichi, 4,045,304, Cl. 204-49.000.
Eli Lilly and Company: *See—*
Beck, James R.; and Yahner, Joseph A., 4,045,466, Cl. 260-465.00E.
Koppel, Gary A., 4,045,435, Cl. 544-28.000.
Eller, Robert: *See—*
Krueger, Theodore H.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,044,816, Cl. 164-63.000.
Ellin, Seymour; and Sharp, John R., to Polaroid Corporation. Extended range exposure control system. 4,045,806, Cl. 354-37.000.
Elliott, John, to Acme Marls Limited. Muffled kiln cars. 4,045,167, Cl. 432-241.000.
Elmer, Arthur Ernest Henry. Automotive cooling fan drive including friction clutch. 4,044,729, Cl. 123-41.120.
Elmore, John E. Sanitary diversion valve. 4,044,789, Cl. 137-367.000.
Emenaker, Leo Joseph: *See—*
Barrus, Gordon Brent; and Emenaker, Leo Joseph, 4,044,668, Cl. 101-93.040.
Emmons, Oren L. Attachment means for screen or storm window. 4,044,813, Cl. 160-369.000.
Endo, Katutoshi: *See—*
Fujimura, Itaru; and Endo, Katutoshi, 4,045,217, Cl. 96-1.0LY.
Engeling, Charles F.; and Staubly, Ralph F. Combined heat-exchanger and supplemental air circulator for hot-air furnaces. 4,044,950, Cl. 237-55.000.
Engelking, Frederick S.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,045,402, Cl. 260-42.180.
England, Will Clarke. Multirotary energy conversion valve. 4,044,562, Cl. 60-721.000.
Englert, William J.: *See—*
Bhardwaj, Mahesh C.; and Englert, William J., 4,045,203, Cl. 65-182.00R.
English Clavs Lovering Pochin & Company, Limited: *See—*
Bidwell, Jan Ivan; Adams, Roger William; and Jepson, Walter Brian, 4,045,235, Cl. 106-72.000.
Entreprise de Recherches et d'Activites Petrolieres: *See—*
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.
Enzinger, Hans Joachim; and Fechner, Hans, to Feldmuhle Anlagen und Produktionsgesellschaft mit beschrankter Haftung. Method of making laminar material having a base of bonded wood particles. 4,045,262, Cl. 156-62.200.
Erickson, Bruce G., to American Microsystems, Inc. Frequency tuning system with visual display. 4,044,597, Cl. 73-6.000.
Erickson, Fred William, to Litton Systems, Inc. Drive circuit with constant current. 4,045,683, Cl. 307-157.000.
Erickson, John W.; and Budrys, Vitolis, to Kobe, Inc. Pitot pump with turbulence elimination. 4,045,145, Cl. 415-89.000.
Erickson, John W.: *See—*
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Ernst, Richard R., to Varian Associates, Inc. Two dimensional gyromagnetic resonance spectroscopy. 4,045,723, Cl. 324-.50A.
Eross, Bela, to Instrumentation Industries, Inc. Slip-proof coupling device. 4,045,058, Cl. 285-119.000.
Erwin, John R.: *See—*
Staub, Anthony F.; Staub, Norman T.; and Erwin, John R., 4,045,025, Cl. 273-73.00F.
Eskeli, Michael. Heat exchanger. 4,044,824, Cl. 165-88.000.
Ester, Gary W., to GTE Automatic Electric Laboratories Incorporated. Negative R-S triggered latch. 4,045,693, Cl. 307-291.000.
Estradier, Francoise: *See—*
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Etablissement Public dit: Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Le Pecq, Jean Bernard; Paoletti, Claude; and Dat-Xuong, Nguyen, 4,045,565, Cl. 424-263.000.
Etat Francias: *See—*
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Green, Derek; Pardoe, John Alan; and Etherington, Clifford, 4,044,587, Cl. 72-261.000.
Ethyl Corporation: *See—*
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Wright, William E., 4,045,519, Cl. 260-976.000.
Etudes et Fabrications: *See—*
Lemaire, Roland, 4,044,959, Cl. 242-25.00A.
Lemaire, Roland, 4,044,960, Cl. 242-25.00A.
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Lecordier, Michel G., 4,045,035, Cl. 277-34.300.
Everhart, John R., to Renfro Corporation. Apparatus and method for forming yarn balls. 4,044,438, Cl. 28-147.000.
Evers, William J.; and Heinsohn, Howard H., Jr., to International Flavors & Fragrances Inc. α-Oxy(oxo) sulfides and ethers. 4,045,491, Cl. 260-594.000.
Evers, William John: *See—*
Katz, Ira; Pittet, Alan O.; Wilson, Richard Arnold; and Evers, William John, 4,045,587, Cl. 426-533.000.
Extel Corporation: *See—*
Cless, Gerhard; and Kaplan, Edward L., 4,044,946, Cl. 234-39.000.
Exxon Research and Engineering Company: *See—*
Green, Robert C.; and Dubell, Robert L., 4,045,328, Cl. 208-8.000.
Stenmark, Donald G.; and Heinrich, Raymond L., 4,045,401, Cl. 260-42.180.
Wheelock, Kenneth S.; and Say, Geoffrey R., 4,045,371, Cl. 252-462.000.
F. L. Smidth & Co.: *See—*
Christiansen, Soren Bent, 4,045,162, Cl. 432-14.000.
Fa. Moebus KG.: *See—*
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Fabbrica Italiana Accumulatori Motocarri Montecchio S.p.A. - F.I.A.M.M.: *See—*
Frigo, Domenico, 4,045,752, Cl. 335-202.000.
Fabricated Plastics Limited: *See—*
Halliday, George Andrew, 4,045,193, Cl. 55-257.0PV.
Fagerburg, David R., to Eastman Kodak Company. Flexible polyester having a melting point of at least 140° C. 4,045,431, Cl. 260-22.00D.
Fails, Hershell W. Deer stand and game carrier. 4,045,040, Cl. 280-1.500.
Fair, James W.: *See—*
Young, Danny J., 4,045,663, Cl. 240-10.6CH.
Fairfield Fiberglass Inc.: *See—*
Rubin, Philip N.; and Fleming, Michael, 4,044,514, Cl. 52-169.700.
Falk Corporation, The: *See—*
Wellauer, Edward J.; and Strommen, John A., 4,044,572, Cl. 64-15.00B.
Falke, Erik, to Svenska Tobaks Aktiebolaget. Method of facilitating exact evaluation or control of the processing of a product mass, and apparatus for carrying said method into effect. 4,045,657, Cl. 235-151.100.
Faller, Hermann, to Faller OHG. Lighting systems for vehicles. 4,045,769, Cl. 340-74.000.
Faller OHG: *See—*
Faller, Hermann, 4,045,769, Cl. 340-74.000.
Fallon, William H.; and Schober, William R., to General Battery Corporation. Battery charger. 4,045,717, Cl. 320-2.000.
Fanta, George F.; and Doane, William M., to United States of America, Agriculture. Highly absorbent polymeric compositions derived from flour. 4,045,387, Cl. 260-17.4GC.
Fanta, Wayne I.; and Shulman, Joel I., to Procter & Gamble Company, The. Insecticidal esters of spiro carboxylic acids. 4,045,469, Cl. 260-469.000.
Farges, Guy, to Etat Francias. Band filters for use in protective glasses. 4,045,125, Cl. 350-166.000.
Farragher, Anthony L.: *See—*
Kwantes, Arien; Gautier, Pieter A.; and Farragher, Anthony L., 4,045,379, Cl. 260-2.20R.

Farzaliev, Mazakhir Gamza Ogly: *See*—
Titov, Dmitry Vladimirovich; Komarov, Jury Ivanovich; Butuzov, Alexei Vasilievich; and Farzaliev, Mazakhir Gamza Ogly, 4,044,801, Cl. 139-436.000.
Fasching, George E.: *See*—
Shuck, Lowell Z.; Fasching, George E.; and Balanis, Constantine A., 4,045,724, Cl. 324-6.000.
Fasco Industries, Inc.: *See*—
Johnson, Robert A., 4,045,757, Cl. 337-85.000.
Fast, Arlo W. Floating fish rearing system. 4,044,720, Cl. 119-3.000.
Fats and Proteins Research Foundation, Inc.: *See*—
Deno, Norman C., 4,045,498, Cl. 260-617.00R.
Favre, Rene Marc: *See*—
Le Cardonnel, Gerard; Gravez, Pierre; and Favre, Rene Marc, 4,045,622, Cl. 179-175.20C.
Fechner, Hans: *See*—
Enzinger, Hans Joachim; and Fechner, Hans, 4,045,262, Cl. 156-62.200.
Federal Laboratories, Inc.: *See*—
Gaggini, Guido John; and Gould, Eugene Lawrence, 4,044,684, Cl. 102-90.000.
Feldman, Harold P., to United States of America, Navy. Cable brake and lock. 4,044,863, Cl. 188-65.100.
Feldmuhle Anlagen und Produktionsgesellschaft mit beschrankter Haftung: *See*—
Enzinger, Hans Joachim; and Fechner, Hans, 4,045,262, Cl. 156-62.200.
Feldstein, Joel Gary; and Martin, Jeffrey Forsha, to Babcock & Wilcox Company, The. Adhesive bonded hydrotest plug and method for using the same. 4,044,798, Cl. 138-90.000.
Felicetta, Vincent F.: *See*—
Wenzel, Donald E.; and Felicetta, Vincent F., 4,045,421, Cl. 260-124.00R.
Fenwick, John Thomas Francis: *See*—
Start, David Gordon Preston; and Fenwick, John Thomas Francis, 4,045,260, Cl. 149-2.000.
Ferrari, Giorgio; Canonica, Luigi; and Danieli, Bruno, to Dauten S.A. Method for the photostabilization of polyhydroxylated sterols and stabilized biological insecticidal product obtained thereby. 4,045,555, Cl. 424-174.000.
Ferrary, Ferdinand F.; Johnson, Herman T.; and Hudson, John H., to AMF Incorporated. Method and apparatus for separating lighter and heavier portions of threshed tobacco. 4,045,334, Cl. 209-141.000.
Ferri, Johann Walter, to Luwa AG. Apparatus for cleaning air. 4,045,194, Cl. 55-290.000.
Ferroni, Bernardo: *See*—
Ullmann, Werner; Ferroni, Bernardo; and Levy, Gideon N., 4,045,641, Cl. 219-69.00C.
Feucht, Dennis D., to Caterpillar Tractor Co. Bushing type mount with triple spring rate. 4,044,977, Cl. 248-7.000.
F'Geppert, Erwin, to United States of America, Army. Transmission. 4,044,620, Cl. 74-190.000.
Fiala, Dennison F.: *See*—
Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry Nash, 4,045,237, Cl. 106-89.000.
Fiat-Allis Construction Machinery, Inc.: *See*—
Hawk, Dale Wyatt, 4,045,050, Cl. 280-492.000.
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Guiraud, Francois, 4,044,578, Cl. 70-366.000.
Ficht, Paulette Gisele: *See*—
Brouard, Claude Marie Henri Emile; and Ficht, Paulette Gisele, 4,045,423, Cl. 260-147.000.
Fierro, Mary M. Decorative article forming support. 4,045,061, Cl. 289-18.000.
Fife, Clemens L., to Raymond Lee Organization, Inc., The. Paint bucket holder. 4,045,069, Cl. 294-31.200.
Figiel, Francis J., to Allied Chemical Corporation. Azeotrope-like compositions of trichloro-trifluoroethane, acetonitrile and acetone. 4,045,365, Cl. 252-141.000.
Figiel, Francis J., to Allied Chemical Corporation. Azeotrope-like compositions of trichlorotrifluoroethane, nitromethane and acetone. 4,045,366, Cl. 252-171.000.
Fildes, Francis James Thomas: *See*—
Martin, Graham Ernest; Cockshott, Ian Derek; and Fildes, Francis James Thomas, 4,044,404, Cl. 3-19.000.
Filliman, Paul, to Magnavox Company, The. Audio control system. 4,045,748, Cl. 330-126.000.
Filtrox Maschinenbau AG: *See*—
Strub, Fritz, 4,045,348, Cl. 210-230.000.
Finke, Manfred; Kleiner, Hans-Jerg; and Lohmar, Elmar, to Hoechst Aktiengesellschaft. Process for preparing 1,2-oxa-phospholanes. 4,045,480, Cl. 260-545.00P.
Firestone Tire & Rubber Company, The: *See*—
Claxton, William E.; and Holden, Harold C., 4,044,600, Cl. 73-15.00R.
Fischer, Artur; and Fischer, Klaus, to Fischer, Artur. Method and arrangement for anchoring an object to a support structure. 4,044,512, Cl. 52-127.000.
Fischer, Hanspeter: *See*—
Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, 4,045,459, Cl. 260-448.80R.
Fischer, Klaus: *See*—
Fischer, Artur; and Fischer, Klaus, 4,044,512, Cl. 52-127.000.
Fischer, Larry J.; and McNellis, Terrence J. Roof insulation support system. 4,044,521, Cl. 52-404.000.
Fischer, Paul W.; and Scheffel, John W., to Union Oil Company of California. Inhibiting wax deposition from a wax-containing oil. 4,045,360, Cl. 252-8.300.
Fischer, Robert B., to Ingersoll-Rand Company. Chrome steel casting alloy. 4,045,256, Cl. 148-36.000.
Fisher, Norman Ernest: *See*—
Waimsley, Robert Edwin; Oliver, Robert; and Fisher, Norman Ernest, 4,044,589, Cl. 72-341.000.
Fisher, Robert J. Inflatable luggage. 4,044,867, Cl. 190-43.000.
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, to Allied Chemical Corporation. Process for melt-spinning synthetic fibers. 4,045,534, Cl. 264-237.000.
Fitzpatrick, Robert E. Animal feeding apparatus. 4,044,723, Cl. 119-61.000.
Flanigen, Edith M.: *See*—
Hill, David C.; and Flanigen, Edith M., 4,045,593, Cl. 427-59.000.
Flannery, John B.: *See*—
Pollack, Joel M.; and Flannery, John B., 4,045,124, Cl. 350-160.0LC.
Fleisch, William F.; and Pousche, Walter. Easy-to-assemble structure. 4,045,090, Cl. 297-440.000.
Fleming, Charles W.: *See*—
Worick, Richard A., 4,044,842, Cl. 172-314.000.
Fleming, Michael: *See*—
Rubin, Philip N.; and Fleming, Michael, 4,044,514, Cl. 52-169.700.
Flex-O-Lators, Inc.: *See*—
Patrick, John H., 4,044,436, Cl. 27-12.000.
Florus, Hans-Jorg; Grossner, Horst; and Weiger, Gunter, to Daimler-Benz Aktiengesellschaft. Installation for automatic shifting of change-speed gears. 4,044,634, Cl. 74-866.000.
FMC Corporation: *See*—
Larsen, Gregory J., 4,044,422, Cl. 15-340.000.
Williams, Michael R.; and McDonald, Dean T., 4,044,952, Cl. 239-165.000.
Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, to Ciba-Geigy Corporation. Agent for the regulation of plant growth. 4,045,459, Cl. 260-448.80R.
Fogelberg, Mark John, to Borg-Warner Corporation. Automatic four-wheel drive transfer case. 4,044,870, Cl. 192-89.00W.
Foley, Charles F.; and Halberstadt, Lewis J. Fish tank construction. 4,044,721, Cl. 119-5.000.
Folik, Joseph C., to Molon Motor & Coil Corporation. Plastic closure cap for electric motor. 4,045,697, Cl. 310-89.000.
Fong, Jaan-Jiue; and Hsu, Grace F., to Minnesota Mining and Manufacturing Company. Cadmium electroplating bath and process. 4,045,305, Cl. 204-50.00R.
Food Processing Systems Corporation: *See*—
Meisel, Nicolas, 4,045,639, Cl. 219-10.55A.
Forbes, Eric Simon; and Reid, Angus Joseph Dickson, to British Petroleum Company Limited, The. Solvent extraction. 4,045,332, Cl. 208-323.000.
Ford, John L. Armboard. 4,045,011, Cl. 269-328.000.
Ford Motor Company: *See*—
Lewis, John A., 4,044,734, Cl. 123-119.00A.
Foresight Industries: *See*—
Deike, Robert F., 4,044,513, Cl. 52-163.000.
Forrester, Joseph J.: *See*—
Castelli, Joseph T.; Forrester, Joseph J.; and Symosko, Stephen, 4,045,788, Cl. 340-323.00R.
Forsgren, Ernst Erik, to Sundin, Anders Eric, a part interest. Method and machine for packing wood chips. 4,044,525, Cl. 53-24.000.
Foster, Stephen J.: *See*—
Davis, Dwight E.; and Foster, Stephen J., 4,045,005, Cl. 259-36.000.
Foulkes, John F., to S&C Electric Company. Remote control fuse closing device. 4,045,762, Cl. 337-401.000.
Fourrey, Francois, to Cycles-Peugeot. Transport and display trolleys. 4,045,043, Cl. 280-79.300.
Fox, Charles J.: *See*—
Contois, Lawrence E.; Fox, Charles J.; and Stahr, Richard W., 4,045,220, Cl. 96-1.600.
Fox, Sam. Crab trap. 4,044,493, Cl. 43-105.000.
Fram Corporation: *See*—
Eaton, Bryan, 4,044,743, Cl. 123-136.000.
Francis, Orville, to Indian Head, Inc. Retractable plasma container holder. 4,044,983, Cl. 248-293.000.
Fransen, Jan Josephus Bernardus: *See*—
Bakel, Adrianus Maria Van; and Fransen, Jan Josephus Bernardus, 4,045,367, Cl. 252-181.400.
Franzmann, Rainer. Device for continous pitch variation of stringed instruments. 4,044,645, Cl. 84-313.000.
Frederick, Richard. Adjustable honing template. 4,044,508, Cl. 51-165.930.
Fremer, William A.: *See*—
Strickland, James K.; Capps, Frank R.; Nekola, Todd B.; and Fremer, William A., 4,044,986, Cl. 249-216.000.
Frenkel, Boris Ovseevich: *See*—
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.
Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Naphthyl acetaldehyde derivatives; methods of use thereof; and processes for the preparation thereof. 4,045,485, Cl. 260-566.00A.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Wetzel, Rolf; and Radke, Dietrich, 4,045,214, Cl. 75-60.000.

Friedric-Wilhelm, Thomas: *See—*
Gernot, Thorn; and Friedric-Wilhelm, Thomas, 4,045,707, Cl. 315-106.000.
Friedrich, Rudolf: *See—*
Moebus, Bernhard; Larch, Gerhard; and Friedrich, Rudolf, 4,044,944, Cl. 233-20.00A.
Frigo, Domenico, to Fabbrica Italiana Accumulatori Motocarri Montecchio S.p.A. - F.I.A.M.M. Compact electromagnetic relay, particularly for automotive vehicles. 4,045,752, Cl. 335-202.000.
Frohmader, Sigrun: *See—*
Ziegler, Gunther; Frohmader, Sigrun; and Wilhelm, Manfred, 4,044,456, Cl. 29-599.000.
Frydryk, John, to Johnson & Johnson. Seed bed cover with improved, reinforced edge sections. 4,044,501, Cl. 47-26.000.
Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Alkoxycarbonylisourea isocyanates. 4,045,473, Cl. 260-482.00C.
Fuchshuber, Peter Werner: *See—*
Rychen, Niklaus; and Fuchshuber, Peter Werner, 4,044,727, Cl. 122-449.000.
Fuhring, Heinrich; and Sieber, Johannes Helmut, to Bowe, Bohler & Weber KG Maschinenfabrik. Method of cleaning textiles. 4,045,174, Cl. 8-142.000.
Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,044,488, Cl. 43-23.000.
Fuji Photo Film Co., Ltd.: *See—*
Hara, Hiroshi; and Miyazako, Takushi, 4,045,226, Cl. 96-60.00R.
Ikenoue, Shinpei; and Mizuki, Eiichi, 4,045,227, Cl. 96-61.00R.
Shimamura, Isao; and Nakamura, Koichi, 4,045,225, Cl. 96-60.00R.
Shinozaki, Fumiaki; Ikeda, Tomoaki; and Tsuboi, Masayoshi, 4,045,222, Cl. 96-33.000.
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, to Hitachi, Ltd. Heat transfer pipe. 4,044,797, Cl. 138-38.000.
Fujikura, Hiroshi, to International Business Machines Corporation. Tape cartridge having a shutter with self locking function. 4,045,821, Cl. 360-132.000.
Fujimori, Noboru: *See—*
Koitabashi, Takeo; Akamatsu, Hideo; and Fujimori, Noboru, 4,045,230, Cl. 96-100.00R.
Fujimoto, Yoshiji: *See—*
Kadota, Shozo; Fujimoto, Yoshiji; Yasuda, Michio; and Oka, Mitsunori, 4,045,773, Cl. 340-146.3SG.
Fujimura, Itaru; and Endo, Katutoshi, to Ricoh Company, Ltd. Developing process for electrophotography. 4,045,217, Cl. 96-1.0LY.
Fujimura, Sigel: *See—*
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.
Fujimura, Takeo: *See—*
Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, 4,045,292, Cl. 201-1.000.
Fujisawa, Kenzo; Sakaedani, Yoshiyasu; and Tsuji, Akio, to Mitsubishi Precision Company, Ltd. Training machine for keyboards. 4,044,475, Cl. 35-6.000.
Fujita, Masao: *See—*
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,045,551, Cl. 424-76.000.
Fujitsu Limited: *See—*
Yamada, Seiichi; and Murakawa, Kyohei, 4,045,412, Cl. 264-63.000.
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, to Matsushita Electric Industrial Co., Ltd. Apparatus for driving liquid crystal display device wherein the signal applied thereto is varied in accordance with the temperature of the device. 4,045,791, Cl. 340-324.00M.
Fukano, Kazuyuki: *See—*
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, 4,045,353, Cl. 210-502.000.
Fukasawa, Akira: *See—*
Yamada, Eiji; Fukasawa, Akira; and Masaki, Shinzaburo, 4,045,454, Cl. 260-369.000.
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, to Ricoh Company, Ltd. Ink ejection printing apparatus comprising automatically actuated ejection orifice cap. 4,045,802, Cl. 346-140.00R.
Fukuchi, Sakae: *See—*
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.
Fukuda, Takeshi: *See—*
Itoh, Kunio; and Fukuda, Takeshi, 4,045,390, Cl. 260-18.00S.
Fukuoka, Itsuo: *See—*
Iida, Masajiro; Morimatsul, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,045,766, Cl. 340-1.00R.
Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Production of chlorine dioxide. 4,045,542, Cl. 423-478.000.
Furst, Andor: *See—*
Cassal, Jean-Marie; Furst, Andor; and Meier, Werner, 4,045,490, Cl. 260-590.0FA.
Furuno Electric Company, Limited: *See—*
Iida, Masajiro; Morimatsul, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,045,766, Cl. 340-1.00R.
Futaba Denshi Kogyo K. K.: *See—*
Kishino, Takao; and Utamura, Yukihiko, 4,045,704, Cl. 313-497.000.
G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,045,442, Cl. 260-293.580.
GAF Corporation: *See—*
Duncan, John J.; and Kirjanov, Alexander, 4,045,172, Cl. 8-115.700.
Gaggini, Guido John; and Gould, Eugene Lawrence, to Federal Laboratories, Inc. Aerosol projectile for lachrymating material. 4,044,684, Cl. 102-90.000.
Gaiardelli, Giuseppe. Pneumatic cleaner particularly for cleaning elements of textile machinery. 4,044,423, Cl. 15-345.000.
Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry Nash, to U.S. Grout Corporation. Cementitious compositions having fast-setting properties and inhibited shrinkage. 4,045,237, Cl. 106-89.000.
Gallaher Limited: *See—*
Boyd, Dennis; and Porter, George, 4,044,777, Cl. 131-2.000.
Garberg, Lars Erik: *See—*
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,563, Cl. 424-263.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,564, Cl. 424-263.000.
Gardner, Jack C., to Glasrock Products, Inc. Foam generating dispenser having a movable and stationary porous element. 4,044,923, Cl. 222-190.000.
Garrett Corporation, The: *See—*
Lewis, Leon David; Wiher, Wilfried; and Parker, Warde L., 4,044,652, Cl. 91-368.000.
Garrett, Donald E., to Occidental Oil Shale, Inc. Fracturing of pillars for enhancing recovery of oil from in situ oil shale retort. 4,045,085, Cl. 299-2.000.
Garrison, Harold Keith: *See—*
Schrag, Thomas Gene; Burkhart, Merle Keith; and Garrison, Harold Keith, 4,044,906, Cl. 214-506.000.
Gates Rubber Company, The: *See—*
Douros, John D., Jr.; and Warder, Ira T., Jr., 4,045,582, Cl. 426-69.000.
Higbee, Charles D.; and Stevens, Bennie A., 4,044,799, Cl. 138-125.000.
Gaumont, Richard J.; Wolfe, Maurice Leonard; and Collins, Robert Lee, to West Manufacturing & Towing Equipment Inc. Automobile towing device. 4,044,900, Cl. 214-86.00A.
Gauriat, Gilles: *See—*
Lagarde, Jean-Louis; and Gauriat, Gilles, 4,045,618, Cl. 179-15.0BS.
Gautier, Pieter A.: *See—*
Kwantes, Arien; Gautier, Pieter A.; and Farragher, Anthony L., 4,045,379, Cl. 260-2.20R.
Gazuit, Georges, to Zelant, Gazuit. Tire upper-bead positioning device for use in a curing press. 4,045,150, Cl. 425-58.000.
Gehrig, Wilfried W., to ITT Industries, Incorporated. MOS power stage for generating non-overlapping two-phase clock signals. 4,045,685, Cl. 307-208.000.
Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, to Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 4,045,457, Cl. 260-381.000.
Gehrmann, Klaus: *See—*
Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Albert, 4,045,295, Cl. 203-79.000.
Geisinger, Wolfgang. Container handle. 4,045,070, Cl. 294-31.200.
Gejyo, Tetsuo: *See—*
Sakurai, Yo; Obayashi, Hidehito; and Gejyo, Tetsuo, 4,044,601, Cl. 73-23.000.
General Aquadyne, Inc.: *See—*
Jones, Richard F., 4,045,813, Cl. 358-99.000.
General Atomic Company: *See—*
Davis, Dwight E.; and Foster, Stephen J., 4,045,005, Cl. 259-36.000.
General Battery Corporation: *See—*
Fallon, William H.; and Schober, William R., 4,045,717, Cl. 320-2.000.
General Cable Corporation: *See—*
Eitel, Jay M., 4,044,902, Cl. 214-132.000.
Stevenson, Robert E., 4,044,856, Cl. 182-2.000.
General Dynamics Corporation: *See—*
Lingley, Richard C.; and Smith, Milburn R., 4,044,974, Cl. 244-161.000.
Maudal, Inge, 4,044,970, Cl. 244-3.220.
Piesik, Edward T., 4,044,648, Cl. 89-1.800.
General Electric Company: *See—*
Armijo, Joseph Sam, 4,045,288, Cl. 176-82.000.
Barkan, Philip, 4,045,633, Cl. 200-148.00A.
Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, 4,045,810, Cl. 357-24.000.
Buzzell, Colby E., 4,045,738, Cl. 324-174.000.
Corrigan, Francis R., 4,045,186, Cl. 23-295.00R.
DeTommasi, Arthur N., 4,045,712, Cl. 315-323.000.
Kingsley, Jack D.; and Woodbury, Henry H., 4,045,675, Cl. 250-370.000.
Lever, Ray C.; and Wilkus, Edward V., 4,045,403, Cl. 260-42.420.
Morais, Don, 4,045,709, Cl. 315-205.000.
Neal, Wayne R., 4,045,708, Cl. 315-171.000.
Neal, Wayne R., 4,045,710, Cl. 315-205.000.
Smashey, Russell W.; and Bartell, Dwight O., 4,044,815, Cl. 164-35.000.
Wilder, Frank A., 4,044,649, Cl. 89-33.0BB.
Yu, Se Puan; and Glover, Gary H., 4,045,727, Cl. 324-58.50B.
Ziemba, Richard T., 4,044,680, Cl. 102-70.20R.

General-Electro Mechanical Corporation: *See*—
Anselmo, Dario, 4,044,462, Cl. 29-809.000.
General Foods Corporation: *See*—
Byrne, Charles H., 4,044,707, Cl. 116-114.500.
Howland, Robert Franklin; Mansky, Michael Herman; and Richards, Willie James, 4,045,586, Cl. 426-387.000.
General Motors Corporation: *See*—
Abu-Akeel, Abdulhadi K.; and Rieck, Gerald C., 4,044,861, Cl. 188-1.00B.
Arlauskas, Alfonsas; and Loose, Richard D., 4,045,079, Cl. 297-216.000.
Disosway, Mark D., III; and Sheldrake, Leonard J., 4,045,062, Cl. 290-38.00R.
Hanson, Richard J., 4,045,667, Cl. 250-226.000.
Hodes, Isidore, 4,045,212, Cl. 75-40.000.
Irwin, Clarence C., 4,045,048, Cl. 280-278.000.
Krage, Mark K., 4,045,797, Cl. 343-8.000.
Nelson, Robert E.; and Pieper, Keith A., 4,044,551, Cl. 60-39.140.
Nestor, Charles R., 4,045,650, Cl. 200-153.00K.
Pees, James M., 4,045,009, Cl. 267-139.000.
Rodondi, Andrew F.; and Hommer, Martin H., 4,045,112, Cl. 339-99.00R.
Vaught, John M., 4,044,553, Cl. 60-39.230.
West, Gene A., 4,044,552, Cl. 60-39.16S.
West, Gene A., 4,044,554, Cl. 60-39.28T.
Zander, Robert W., 4,044,627, Cl. 74-574.000.
General Tire & Rubber Company, The: *See*—
Dudek, Thomas J.; Marker, Leon F.; and Janssen, Hendrik Jan Jacob, 4,044,811, Cl. 152-354.000.
Kuan, Tiong H.; and Sommer, John G., 4,045,362, Cl. 252-14.000.
Geometric Data Corporation: *See*—
Bouton, John C.; Partin, Melvin E.; and Hilghman, Robert C., 4,045,772, Cl. 340-146.30B.
Georg Fischer Aktiengesellschaft: *See*—
Heiss, Wolfgang, 4,044,938, Cl. 226-168.000.
Georgia-Pacific Corporation: *See*—
Wenzel, Donald E.; and Felicetta, Vincent F., 4,045,421, Cl. 260-124.00R.
Geraci, James Leonard, to Xomed, Inc. Drape for operating microscope. 4,045,118, Cl. 350-61.000.
Gerecht, John Fred, to Colgate-Palmolive Company. Sulfonium salt substantive sunscreen compositions. 4,045,549, Cl. 424-60.000.
Germani, Cesare, to Omita S.p.A. Loom with shuttles. 4,044,800, Cl. 139-341.000.
Gernot, Thorn; and Friedric-Wilhelm, Thomas, to Leybold-Heraeus GmbH & Co. KG. System for the power control of high voltage electron beam generators. 4,045,707, Cl. 315-106.000.
Gerrard, Alan Joseph, to Lucas Industries Limited. Burner assembly for an inlet manifold of an internal combustion engine. 4,044,740, Cl. 123-122.00G.
Geschwender, Robert C., to Bell Fibre Products Corporation; and Geschwender, Robert C., part interest to each. Mastic composition and composite structural panels formed therefrom. 4,045,268, Cl. 156-197.000.
Gestetner Limited: *See*—
Maynard, Michael, 4,044,670, Cl. 101-128.100.
Gewerkschaft Eisenhutte Westfalia: *See*—
Hauschopp, Alois; Schlusener, Horst; and Rassmann, Christoph, 4,045,089, Cl. 299-43.000.
Stuckmann, Dieter, 4,044,565, Cl. 61-41.00A.
Ghany, Michael. Candle making apparatus. 4,044,985, Cl. 249-205.000.
Ghayouran, Bahman. Auto-transfusion torniquet appliance and method of utilizing the same to control flow of blood through a blood vessel. 4,044,759, Cl. 128-24.00R.
Ghigini, Rino. Electric sphygmomanometer. 4,044,615, Cl. 73-391.000.
Gibbs, Stephen R.; and Chow, Kuen, to Burroughs Corporation. Multilevel metallization process. 4,045,302, Cl. 204-15.000.
Gidak, Edward J., Jr.: *See*—
Adams, Ben E.; and Gidak, Edward J., Jr., 4,045,335, Cl. 209-166.000.
Giese, Alice F., executrix: *See*—
Giese, Elroy J., deceased, 4,044,998, Cl. 251-331.000.
Giese, Elroy J., deceased (by Giese, Alice F., executrix), to Tomlinson Industries, Inc. Web tip seat cup. 4,044,998, Cl. 251-331.000.
Giesselmann, Hannes; and Rendahl, Karl Ingvar Fredrik, to Husqvarna Aktiebolag. Sewing machine frame with presser foot and needle bar unit. 4,044,701, Cl. 112-259.000.
Giggi, Robert: *See*—
Levy, John V.; Northrup, Thomas A.; and Giggi, Robert, 4,045,781, Cl. 364-200.000.
Gill, Chester C. Trailer direction indicator. 4,044,706, Cl. 116-31.000.
Gillespie, Richard Lee; and Melin, Arthur Kelso, to Wham-O Mfg. Co. Jai alai apparatus. 4,045,026, Cl. 273-96.00R.
Gillis, Robert E.: *See*—
Hamilton, Robert W.; and Gillis, Robert E., 4,044,756, Cl. 128-2.00N.
Girard, Gerald H. Quick release for waders. 4,044,478, Cl. 36-1.500.
Girdjev, Georgi Petrov: *See*—
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.
Glacier Metal Company Limited, The: *See*—
Morrison, William Craig, 4,044,441, Cl. 29-149.50R.
Glas, Lars-Olof: *See*—
Morawetz, Ernst; and Glas, Lars-Olof, 4,044,949, Cl. 237-1.00A.
Glasrock Products, Inc.: *See*—
Gardner, Jack C., 4,044,923, Cl. 222-190.000.
Glover, Gary H.: *See*—
Yu, Se Puan; and Glover, Gary H., 4,045,727, Cl. 324-58.50B.
Gluecksmann, Alfred: *See*—
Marans, Nelson Samuel; and Gluecksmann, Alfred, 4,045,396, Cl. 260-29.2TN.
Glynn, Paul Anthony: *See*—
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,045,583, Cl. 426-241.000.
Goerens, Robert L., to Uniroyal Luxembourg S.A. Aerodynamic ring travelers for yarn twisters. 4,044,539, Cl. 57-125.000.
Goettl, Adam D. Evaporative cooler with superimposed disposable pad assemblies. 4,045,523, Cl. 261-97.000.
Gokyu, Isao, to Nippon Concrete Industries Co., Ltd. Method of making reinforcements for concrete. 4,044,640, Cl. 83-42.000.
Goldmark Communications Corporation: *See*—
Goldmark, Peter C., 4,045,819, Cl. 360-8.000.
Goldmark, Peter C., to Goldmark Communications Corporation. Video recorder and playback apparatus. 4,045,819, Cl. 360-8.000.
Goldstein, David; Pless, William C.; Shapiro, Michael; Spencer, Dana; and Starr, Leland E., Jr., to United States of America, Navy. Test system for evaluation of armors using duplicate fragments. 4,044,599, Cl. 73-12.000.
Gomiero, Valeriano. Swivel hitch structure. 4,045,143, Cl. 403-102.000.
Gony, Jean-Noel: *See*—
Benedetto, Alexandre; Cuvillier, Roger O.; and Gony, Jean-Noel, 4,044,956, Cl. 241-24.000.
Goodman, Manuel; and Jaremus, Boubene M. Pressurized fluid powered horn. 4,044,712, Cl. 116-142.0FP.
Goranson, Paul L.: *See*—
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,044,914, Cl. 220-93.000.
Gorr, Theodor Wilhelm, to Zeuthen & Aagaard A/S. Printing machine, in particular an office offset machine with means for pre-curving the master. 4,044,672, Cl. 101-132.500.
Gosteli, Jacques, to Ciba-Geigy Corporation. Process for the manufacture of thioformamido-phosphono-acetates. 4,045,520, Cl. 260-985.000.
Goto, Makoto: *See*—
Kinugasa, Akikazu; Okuda, Toshio; Goto, Makoto; and Saito, Mitsuo, 4,045,450, Cl. 260-343.600.
Goto, Tadaaki, to Trio Kabushiki Kaisha. Automatic sweep circuit. 4,045,713, Cl. 315-391.000.
Gould, Eugene Lawrence: *See*—
Gaggini, Guido John; and Gould, Eugene Lawrence, 4,044,684, Cl. 102-90.000.
Grah, Gerd: *See*—
Judat, Artur; Judat, Helmut; and Grah, Gerd, 4,045,190, Cl. 55-93.000.
Grajnert, Zbigniew. Trap for flying insects and bugs. 4,044,494, Cl. 43-119.000.
Granges Essem Aktiebolag: *See*—
Wallin, Jan-Olof, 4,044,969, Cl. 242-107.40A.
Grant, Geoffrey F.; and Nicks, Robert W. No-line tennis court. 4,045,022, Cl. 273-29.00R.
Grasmugg, Karl: *See*—
Burkert, Walter; Hopfer, Walter; and Grasmugg, Karl, 4,045,643, Cl. 219-98.000.
Graul, Juergen; and Murrmann, Helmuth, to Siemens Aktiengesellschaft. Process for producing an inversely operated transistor. 4,045,251, Cl. 148-1.500.
Gravez, Pierre: *See*—
Le Cardonnel, Gerard; Gravez, Pierre; and Favre, Rene Marc, 4,045,622, Cl. 179-175.20C.
Gray, Alden J., to Maremont Corporation. Multiple winding multiple voltage alternator electrical supply system. 4,045,718, Cl. 320-17.000.
Greber, Gerd: *See*—
Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, 4,045,459, Cl. 260-448.80R.
Green, David L., to Pacer Systems, Inc. Omnidirectional speed cockpit display. 4,044,709, Cl. 116-129.00F.
Green, Derek; Pardoe, John Alan; and Etherington, Clifford, to United Kingdom Atomic Energy Authority. Forming of materials by extrusion. 4,044,587, Cl. 72-261.000.
Green, Robert C.; and Dubell, Robert L., to Exxon Research and Engineering Company. Production of hydrogenated coal liquids. 4,045,328, Cl. 208-8.000.
Green, Sidney Joseph: *See*—
Jones, Arfon Harry; Swolfs, Henri Samuel; and Green, Sidney Joseph, 4,044,828, Cl. 166-250.000.
Greene, Edwin R.; and Greene, Rodney F. Animal dryer. 4,044,474, Cl. 34-86.000.
Greene, Rodney F.: *See*—
Greene, Edwin R.; and Greene, Rodney F., 4,044,474, Cl. 34-86.000.
Greenfield, Harold: *See*—
Malz, Russell E., Jr.; Amidon, Roger W.; and Greenfield, Harold, 4,045,484, Cl. 260-561.00H.
Greenwald, Harry; and Iglio, Salvatore, to Walter Kidde & Company, Inc. Removable funnel for a coin operated apparatus. 4,044,875, Cl. 194-1.00K.
Gregory, Dale R.: *See*—
Phillips, Bobby M.; and Gregory, Dale R., 4,045,529, Cl. 264-75.000.

Grenon, Michel: *See—*
Blum, Jacques Marcel; Grenon, Michel; and Ventre, Edmond, 4,045,286, Cl. 176-49.000.

Greten, Berndt, to bison-Werke Bahre & Greten GmbH & Co. KG. Process for the production of chipboards and the like. 4,045,531, Cl. 264-113.000.

Gribova, Irina Alexandrovna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Griebsch, Eugen: *See—*
Drawert, Manfred; Griebsch, Eugen; and Imoehl, Wolfgang, 4,045,389, Cl. 260-18.00N.

Griffin, Clyde C.: *See—*
Griffin, J. Curtis; and Griffin, Clyde C., 4,045,066, Cl. 294-5.500.

Griffin, J. Curtis; and Griffin, Clyde C., to Harrington Manufacturing Company. Bulk tobacco container. 4,045,066, Cl. 294-5.500.

Griffith, James M.; and Henry, Walter L., to United States of America, Health, Education and Welfare. System for combining analog and image signals into a standard video format. 4,045,815, Cl. 358-183.000.

Griffith, James R.; and O'Rear, Jacques G., to United States of America, Navy. Fluoro-anhydride curing agents and precursors thereof for fluorinated epoxy resins. 4,045,408, Cl. 260-47.0EA.

Griffith, Robert G., to Youngstown Sheet and Tube Company. Work guide for pipe reeling machines and the like and process for treating the same. 4,044,582, Cl. 72-97.000.

Grigorov, Ivaylo Yanev: *See—*
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.

Gripshover, David F.: *See—*
Dille, Roger M.; Van Stavern, Merle H.; Shull, Don L.; and Gripshover, David F., 4,045,671, Cl. 250-341.000.

Griswold, James L. Trench shoring assembly with corner guard accessory. 4,044,564, Cl. 61-41.00A.

Gronholz, Donald D. Router guide unit. 4,044,805, Cl. 144-134.00D.

Gros, Hermann, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Release stop for disc clutch. 4,044,869, Cl. 192-48.910.

Grossner, Horst: *See—*
Florus, Hans-Jorg; Grossner, Horst; and Weiger, Gunter, 4,044,634, Cl. 74-866.000.

Grovesteen, William R.: *See—*
Le Boeuf, Albert R.; and Grovesteen, William R., 4,045,547, Cl. 424-28.000.

Grunberg, Emanuel: *See—*
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,045,487, Cl. 260-570.50C.

Grycel, Felix John, III. Boat construction and mold. 4,044,414, Cl. 9-6.00R.

GTE Automatic Electric Laboratories Incorporated: *See—*
Ester, Gary W., 4,045,693, Cl. 307-291.000.

GTE Sylvania Incorporated: *See—*
Chu, Gordon P. K.; Shinn, Dennis B.; and Waymouth, John F., 4,045,156, Cl. 431-95.00R.
Pearce, Daniel S., 4,045,775, Cl. 340-147.00R.
Pitel, Ira Jay, 4,045,711, Cl. 315-209.00R.
White, Robert S., Jr., 4,045,645, Cl. 219-118.000.

Guardpack, Incorporated: *See—*
Ramsey, John W., Jr., 4,044,693, Cl. 105-468.000.

Guerette, Marcel, to Moody Si Ltd. Mobile ladder. 4,044,857, Cl. 182-17.000.

Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., to Rohm and Haas Company. Polyacrylic hot melt adhesives. 4,045,517, Cl. 260-901.000.

Guerrico Echevarria, Nicolas, to Plasticos Mel S.A. Tightening and sealing device. 4,044,809, Cl. 151-19.00R.

Gugenberger, Rene; and Martin, Roger, to Commissariat a l'Energie Atomique. Heat exchanger for high temperature. 4,044,825, Cl. 165-165.000.

Guichon, Lawrence Joseph Charles. Round bale feeder. 4,044,967, Cl. 242-86.50R.

Guillon, Marcel F., to D. B. A. Hydraulic engine. 4,044,654, Cl. 91-499.000.

Guiraldenq, Pierre; Treheux, Daniel; and Marchive, Daniel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Superficial treatment of steel. 4,045,596, Cl. 427-229.000.

Guiraud, Francois, to Fichet-Bauche. Safety lock. 4,044,578, Cl. 70-366.000.

Guiset, Jacques. Artificial bladder. 4,044,401, Cl. 3-1.000.

Gulf Oil Corporation: *See—*
Sinclair, Richard G., 4,045,418, Cl. 260-78.30R.

Gulf Research & Development Company: *See—*
Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., 4,045,182, Cl. 23-288.00R.
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,507, Cl. 260-683.15B.
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,508, Cl. 260-683.15B.
Innes, Robert A.; and Perrotta, Anthony J., 4,045,373, Cl. 252-469.000.
Somers, Allen E., 4,045,333, Cl. 208-327.000.

Gulf & Western Manufacturing Company: *See—*
Carrieri, Louis F.; Brownell, James R.; Helrigel, Robert A.; Ward, Roderick K.; and Wroblewski, Jerome J., 4,044,592, Cl. 72-462.000.

Gulzek, Karl-Heinz: *See—*
Asinger, Friedrich; Offermanns, Heribert; and Gulzek, Karl-Heinz, 4,045,479, Cl. 260-534.00S.

Gunther, Stefan, to Siemens Aktiengesellschaft. Use of light-metal panes as X-ray transmissive windows. 4,045,699, Cl. 313-59.000.

Gupta, Kedar P.: *See—*
Burd, John W.; Stone, Bobbie D.; Tucker, William F.; and Gupta, Kedar P., 4,045,181, Cl. 23-273.00R.

Gureeva, Galina Ilinichna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Guthrie, James Leverette; and Kehr, Clifton Leroy, to W. R. Grace & Co. Urethane polythiols. 4,045,472, Cl. 260-471.00C.

Gutjahr, Erwin, to Karl Handle & Sohne Maschinenfabrik und Eisengiesserei. Edge mill. 4,044,958, Cl. 241-126.000.

Gutweiler, Klemens: *See—*
Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, 4,045,415, Cl. 260-67.0FP.

H. H. Robertson Company: *See—*
Davis, Bernard H.; Mack, Rollin T.; and Miyasaki, Kenneth, 4,045,267, Cl. 156-197.000.

Habert, William C.; and Jawanda, Jasjit S., to Uniroyal, Inc. Pneumatic tire building drum. 4,045,277, Cl. 156-417.000.

Haefliger, Walter: *See—*
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,045,573, Cl. 424-279.000.

Hagen, William F., to Turbo Refrigerating Company. Space heating and cooling system. 4,044,568, Cl. 62-73.000.

Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, to Roussel Uclaf. Substituted ureas as herbicides. 4,045,209, Cl. 71-98.000.

Haines, Allan D., to National Machinery Co., The. High speed ball header. 4,044,588, Cl. 72-337.000.

Halberstadt, Lewis J.: *See—*
Foley, Charles F.; and Halberstadt, Lewis J., 4,044,721, Cl. 119-5.000.

Halcon International, Inc.: *See—*
Becker, Mitchell; and Valbert, Jon R., 4,045,294, Cl. 203-69.000.
Onsager, Olav T.; and Szecsi, Peter L., 4,045,500, Cl. 260-635.00H.
Winnick, Charles N., 4,045,419, Cl. 260-681.000.

Hall, John B.: *See—*
Wiegers, Wilhelmus Johannen; and Hall, John B., 4,045,489, Cl. 260-586.00C.

Hall, John Ives, to Smith & Nephew Research Limited. Orthopaedic bandage. 4,044,761, Cl. 128-90.000.

Halliburton Company: *See—*
Banks, William P.; and Martin, Larry D., 4,045,253, Cl. 148-6.14R.
Jessup, Robert L.; and Coleman, Joe E., 4,044,829, Cl. 166-264.000.

Halliday, George Andrew, to Fabricated Plastics Limited. Cooling tower design. 4,045,193, Cl. 55-257.0PV.

Halter, Edmund John, to Burgess Industries Incorporated. Vibration barrier/structural connector for conduits and the like. 4,045,057, Cl. 285-49.000.

Hamada, Koichi; Kikubu, Kaoru; and Itoh, Tsunehiro, to Nippon Seisen, Co., Ltd. Method of simultaneously drawing a number of wire members. 4,044,447, Cl. 29-419.00R.

Hamar, Martin R. Apparatus for hard mounting an optical member to a rigid base. 4,045,129, Cl. 350-321.000.

Hamilton, Robert W.; and Gillis, Robert E. Phosphene generator device. 4,044,756, Cl. 128-2.00N.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Inking mechanism. 4,044,677, Cl. 101-348.000.

Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Bytzek, Max, to Hoechst Aktiengesellschaft. Process for the production of thermoplastic synthetic materials and plastic shaping materials of chemically modified protein and a chemical plasticizer and including a bisacrylamide or bismethacrylamide. 4,045,239, Cl. 106-147.000.

Hammond, Theodore A. Fail-safe gravity conveyor. 4,044,876, Cl. 193-35.0SS.

Hamprecht, Rainer, to Bayer Aktiengesellschaft. Conversion of o-halogenoazo compound to o-cyanoazo compound by reaction with a zinc cyanide. 4,045,430, Cl. 260-208.000.

Hanemann, Horst J.: *See—*
Loveland, Winton; and Hanemann, Horst J., 4,045,273, Cl. 156-486.000.

Hansen, Richard. Inventory control board. 4,044,710, Cl. 116-133.000.

Hanson, Douglas R. Pan cleaning apparatus. 4,044,420, Cl. 15-304.000.

Hanson, Richard J., to General Motors Corporation. Color-sensitive photoelectric control system with fiber optics. 4,045,667, Cl. 250-226.000.

Hara, Hiroshi; and Miyazako, Takushi, to Fuji Photo Film Co., Ltd. Image forming process by color intensification. 4,045,226, Cl. 96-60.00R.

Haraguchi, Youichiro: *See*—
Urai, Muneharu; Kogure, Koji; and Haraguchi, Youichiro, 4,044,715, Cl. 118-50.000.

Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, to Kzm "D. Blagoev". Fluidized-bed reactor for carrying out chemical reactions between liquids and solid granulated substances. 4,045,184, Cl. 23-283.000.

Hard, Robert A.: *See*—
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,045,084, Cl. 299-4.000.

Hardinge Brothers, Inc.: *See*—
Lyon, Garnet Rexford; and Brown, Ivan Richard, 4,044,650, Cl. 90-14.000.

Hardt, Dietrich: *See*—
Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, 4,045,382, Cl. 260-4.00R.

Hardy, Robert Allis, Jr.; and Quinones, Nicanor Quinones, to American Cyanamid Company. 11-(4-Piperidyl)dibenzo-diazepines. 4,045,445, Cl. 260-293.590.

Hargraves, William J. Compact portable self-contained aerobic digestion toilet. 4,044,406, Cl. 4-10.000.

Hargreaves, Clifford McDonald, to U.S. Philips Corporation. Heat insulation system. 4,044,911, Cl. 220-9.0LG.

Harland, Robert Francis, to Standard Microsystems Corporation. MOS one transistor cell RAM having divided and balanced bit lines, coupled by regenerative flip-flop sense amplifiers, and balanced access circuitry. 4,045,783, Cl. 340-173.00R.

Harrington, Laurence P., to Aristonics Corporation. Telephone control system. 4,045,619, Cl. 179-18.0DA.

Harrington Manufacturing Company: *See*—
Griffin, J. Curtis; and Griffin, Clyde C., 4,045,066, Cl. 294-5.500.

Harris Corporation: *See*—
Sanders, Thomas J., 4,045,259, Cl. 148-188.000.

Harris, Ellsworth L., Jr. Smoking pipe sling. 4,044,932, Cl. 224-26.00R.

Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, to Bassinger Tool Enterprises, Ltd. Impact drilling tool. 4,044,844, Cl. 173-73.000.

Harris, Rano J., Jr.: *See*—
Harris, Rano J., Sr.; Harris, Rano J., Jr.; and Averette, Julius P., Jr., 4,044,616, Cl. 73-422.0GC.

Harris, Rano J., Sr.; Harris, Rano J., Jr.; and Averette, Julius P., Jr. Automatic fluid injector. 4,044,616, Cl. 73-422.0GC.

Harris, Richard T., to Sismore, William W., a part interest. Tube traveler. 4,044,444, Cl. 29-727.000.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 4,045,485, Cl. 260-566.00A.

Hart, John A. H., to Canada, Her Majesty the Queen in right of. Gas resistant foam materials. 4,045,609, Cl. 428-253.000.

Hart, Thomas Brian: *See*—
Parkes, David M.; and Hart, Thomas Brian, 4,045,086, Cl. 299-17.000.

Hartman, Seymour, to Champion International Corporation. Alkali-treated bark extended tannin-aldehyde resinous adhesives. 4,045,386, Cl. 260-17.200.

Hartsough, Lloyd Bruce: *See*—
Adrion, David Martin; and Hartsough, Lloyd Bruce, 4,044,782, Cl. 132-7.000.

Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., to System Development Corporation. Method and apparatus for scrambling and unscrambling communication signals. 4,045,814, Cl. 358-124.000.

Haruki, Tatsuro; and Hayashi, Yoshiro, to Shimadzu Seisakusho Ltd. Chromatograph. 4,044,593, Cl. 73-23.100.

Harvey, Thomas G., Jr. Pumping ratchet winch. 4,045,001, Cl. 254-164.000.

Harza, Richard D. Refuse disposal apparatus. 4,044,569, Cl. 62-341.000.

Hasebe, Shinji: *See*—
Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, 4,045,292, Cl. 201-1.000.

Hashimoto, Susumu: *See*—
Nakatani, Hirokuni; Takamura, Toru; and Hashimoto, Susumu, 4,045,817, Cl. 358-213.000.

Hashimoto, Tsutomu: *See*—
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, 4,045,353, Cl. 210-502.000.

Hattler, Louis R.: *See*—
Menon, Sukumaran K.; and Hattler, Louis R., 4,045,163, Cl. 432-59.000.

Hattori, Katsuji: *See*—
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, 4,045,791, Cl. 340-324.00M.

Hauni-Werke Korber & Co. KG: *See*—
Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, 4,044,659, Cl. 93-77.0FT.

Hauschopp, Alois; Schlusener, Horst; and Rassmann, Christoph, to Gewerkschaft Eisenhutte Westfalia. Apparatus for controlling the position of a mining machine. 4,045,089, Cl. 299-43.000.

Hauser, Daniel: *See*—
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,045,573, Cl. 424-279.000.

Haverberg Auto Laundry Equipment Co. Inc.: *See*—
Van Brakel, Russel A., 4,044,686, Cl. 104-172.00B.

Haverdink, Virgil Dean, to Deere & Company. Cleaner for root crop harvester conveyor. 4,044,837, Cl. 171-58.000.

Haviv, Fortuna; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. Cephalosporin antibiotics. 4,045,438, Cl. 544-29.000.

Hawk, Dale Wyatt, to Fiat-Allis Construction Machinery, Inc. Articulated vehicle tilt limiting apparatus. 4,045,050, Cl. 280-492.000.

Hawkins, John L.: *See*—
Langenbach, Jack E.; and Hawkins, John L., 4,045,109, Cl. 339-75.00M.

Hayashi, Gentaro; Yamamoto, Kenji; and Yamamoto, Yasakao, to Sanyo Electric Co., Ltd. Balancing ring of centrifugal extractor. 4,044,626, Cl. 74-573.00F.

Hayashi, Masamichi: *See*—
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, 4,045,135, Cl. 355-11.000.

Hayashi, Yoshiro: *See*—
Haruki, Tatsuro; and Hayashi, Yoshiro, 4,044,593, Cl. 73-23.100.

Hayashibara Biochemical Laboratories, Inc.: *See*—
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.
Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, 4,045,388, Cl. 260-17.4ST.

Hayes International Corporation: *See*—
McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., 4,044,555, Cl. 60-264.000.

Hazell, Paul Alexander: *See*—
Bartram, Trevor Carlisle; and Hazell, Paul Alexander, 4,045,716, Cl. 318-154.000.

Heckendorn, Roland: *See*—
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 4,045,570, Cl. 424-275.000.

Hecking, Ludger: *See*—
Punsmann, Josef; and Hecking, Ludger, 4,044,872, Cl. 192-103.00A.

Hedberg, Frederick L.: *See*—
Arnold, Fred E.; and Hedberg, Frederick L., 4,045,409, Cl. 260-49.000.

Hedstrom Co.: *See*—
Boucher, Raymond W.; and Ziegler, William H., Jr., 4,045,045, Cl. 280-87.02W.

Heffley, Russell H., Jr. Game apparatus. 4,045,023, Cl. 273-35.00B.

Heffron, Allan J.; and Kennedy, Leverne H., to Crankshaft Machine Company; and C. M. Systems, Incorporated. Crankshaft machine stock and chuck apparatus. 4,044,638, Cl. 82-9.000.

Heggestuen, James E. Smoking device. 4,044,781, Cl. 131-173.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Junghans, Rudi, 4,044,673, Cl. 101-148.000.

Heilman, William J.: *See*—
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,507, Cl. 260-683.15B.
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,508, Cl. 260-683.15B.

Heilmann & Littmann Bau-Aktiengesellschaft: *See*—
Schleich, Josef; and Zwisler, Hans, 4,045,355, Cl. 210-532.00R.

Heiner Stuhfauth GmbH: *See*—
Brutting, Eugen, 4,044,479, Cl. 36-32.00R.

Heinrich, Raymond L.: *See*—
Stenmark, Donald G.; and Heinrich, Raymond L., 4,045,401, Cl. 260-42.180.

Heinsohn, Howard H., Jr.: *See*—
Evers, William J.; and Heinsohn, Howard H., Jr., 4,045,491, Cl. 260-594.000.

Heinzer, Jorg: *See*—
Schiess, Georg; and Heinzer, Jorg, 4,044,464, Cl. 30-164.900.

Heiss, Wolfgang, to Georg Fischer Aktiengesellschaft. Wire coil guiding device for wire treatment apparatus. 4,044,938, Cl. 226-168.000.

Heller, Henry B.: *See*—
Rod, Robert L.; Penick, Walter L., Jr.; and Heller, Henry B., 4,045,314, Cl. 204-151.000.

Helms, C. R., to Container Corporation of America. Wrapper blank. 4,044,940, Cl. 229-40.000.

Helrigel, Robert A.: *See*—
Carrieri, Louis F.; Brownell, James R.; Helrigel, Robert A.; Ward, Roderick K.; and Wroblewski, Jerome J., 4,044,592, Cl. 72-462.000.

Henault, Marc Patrice Sylvain: *See*—
Deportes, Charles Henri; Henault, Marc Patrice Sylvain; Tasset, Francis; and Vitter, Gerard Raymond Robert, 4,045,319, Cl. 204-195.00S.

Henry, Vincent I.: *See*—
Tsai, Yih-Wan; Sensi, John E.; and Henry, Vincent I., 4,045,197, Cl. 65-27.000.

Henry, Walter L.: *See*—
Griffith, James M.; and Henry, Walter L., 4,045,815, Cl. 358-183.000.

Hens, Karel: *See*—
Wens, Karel; Tobback, Hubert; and Hens, Karel, 4,045,301, Cl. 204-12.000.

Henson, Jimmy B., to Milliken Research Corporation. Coating method and apparatus. 4,045,598, Cl. 427-296.000.

Henze, Walter J.; and Thein, San, to Penn Fishing Tackle Mfg. Co. Trolling apparatus. 4,044,489, Cl. 43-27.400.

Heraeus Quarzschmelze GmbH: *See*—
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,045,198, Cl. 65-33.000.
Hercules Incorporated: *See*—
Pearson, Stephen C., 4,045,377, Cl. 260-2.0BP.
Hermansen, Ralph David: *See*—
Voss, David Lehmann; Miller, William Albert; and Hermansen, Ralph David, 4,045,269, Cl. 156-221.000.
Herrling, Siegfried: *See*—
Schwertner, Eberhard; and Herrling, Siegfried, 4,045,556, Cl. 424-177.000.
Herrmann, Werner Martin: *See*—
Itil, Turan M.; and Herrmann, Werner Martin, 4,045,562, Cl. 424-261.000.
Hertzog, Richard Ross, to Allied Chemical Corporation. Process for the synthesis of ammonium nitrite. 4,045,540, Cl. 423-385.000.
Herzog, Helmut: *See*—
Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, 4,045,457, Cl. 260-381.000.
Heseltine, Donald Warren: *See*—
Weber, Wayne Woodrow, II; and Heseltine, Donald Warren, 4,045,229, Cl. 96-84.0UV.
Hess, Hans-Jurgen E.; and Schaaf, Thomas K., to Pfizer Inc. Cyanoprostaglandins. 4,045,465, Cl. 260-464.000.
Hess, Lawrence George, to Union Carbide Corporation. Viscosity stabilization of vicinal acryloxy hydroxyl derivatives of linseed oil with N-alkylmorpholines. 4,045,394, Cl. 260-23.0AR.
Hesston Corporation: *See*—
Schrag, Thomas Gene; Burkhart, Merle Keith; and Garrison, Harold Keith, 4,044,906, Cl. 214-506.000.
Stoessel, Herman V.; and Prichard, Daniel R., 4,044,557, Cl. 60-420.000.
Hewitt, William T., Jr. Picture framing method and kit. 4,045,266, Cl. 156-91.000.
Hewlett-Packard Company: *See*—
Eads, William Donovan; and Maitland, David Steven, 4,045,684, Cl. 307-200.00B.
Hice, Phate: *See*—
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Higashi, Fukuji: *See*—
Yamazaki, Noboru; and Higashi, Fukuji, 4,045,417, Cl. 260-78.00A.
Higbee, Charles D.; and Stevens, Bennie A., to Gates Rubber Company, The. Cellular wall hose and method for making same. 4,044,799, Cl. 138-125.000.
Higgs, Kenneth O.; and Marsch, Lawrence F., to Texaco Inc. Consistometer with internal calibration means. 4,044,602, Cl. 73-59.000.
Higgs, Kenneth O.; and Marsch, Lawrence F., to Texaco Inc. Consistometer with automatic shut-down. 4,044,603, Cl. 73-59.000.
Hikosaka, Takashi: *See*—
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, 4,045,135, Cl. 355-11.000.
Hilghman, Robert C.: *See*—
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Hill, David C.; and Flanigen, Edith M., to Union Carbide Corporation. Method for producing moisture resistant electrodes. 4,045,593, Cl. 427-59.000.
Hill, Thomas; Kennedy, Ambrose; and Thomson, Walter Grey, to International Business Machines Corporation. Multiple ball element wafer breaking apparatus. 4,044,937, Cl. 225-97.000.
Hillenbrand, George C. Container for flowers. 4,044,502, Cl. 47-41.120.
Hiller, Dale Murray: *See*—
Williston, David Wyckoff; Bancroft, Lewis Clinton; and Hiller, Dale Murray, 4,045,544, Cl. 423-607.000.
Hills-McCanna Company: *See*—
Priese, Werner K., 4,044,994, Cl. 251-172.000.
Hilti Aktiengesellschaft: *See*—
Burkert, Walter; Hopfer, Walter; and Grasmugg, Karl, 4,045,643, Cl. 219-98.000.
Rumpp, Gerhard; Kruger, Wilm; and Scholz, Dieter, 4,044,845, Cl. 175-409.000.
Himics, Richard Joseph; Desai, Nitin Vithalbhai; and Poliniak, Eugene Samuel, to RCA Corporation. Method of transferring a surface relief pattern from a poly(olefin sulfone) layer to a metal layer. 4,045,318, Cl. 204-192.00E.
Hindes Limited: *See*—
Merchill, Geoffrey Leonard, 4,044,724, Cl. 119-83.000.
Hiraki, Masahiro: *See*—
Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, 4,045,292, Cl. 201-1.000.
Hirano, Mikio; Takeshima, Masaki; Saito, Toru; and Shimozato, Atou, to Hitachi, Ltd. Process for decontaminating gas containing radioactive iodine. 4,045,539, Cl. 423-240.000.
Hirasawa, Koichi: *See*—
Tateno, Hidenori; Yoshida, Toshiro; and Hirasawa, Koichi, 4,044,736, Cl. 123-119.00F.
Hirata, Yasuo: *See*—
Takahata, Fumio; Takahashi, Toshio; and Hirata, Yasuo, 4,045,614, Cl. 178-69.100.
Hirschey, Kenneth A. Fuel additives for internal combustion engines. 4,045,188, Cl. 44-56.000.
Hirtenberger Patronen-, Zundhutchen- und Metallwarenfabrik Aktiengesellschaft: *See*—
Avcin, France, 4,044,685, Cl. 102-91.000.
Hitachi, Ltd.: *See*—
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.
Hirano, Mikio; Takeshima, Masaki; Saito, Toru; and Shimozato, Atou, 4,045,539, Cl. 423-240.000.
Hotta, Atsuo, 4,045,249, Cl. 148-1.500.
Kadota, Shozo; Fujimoto, Yoshiji; Yasuda, Michio; and Oka, Mitsunori, 4,045,773, Cl. 340-146.3SG.
Kamimura, Shoji; and Salto, Yasushi, 4,045,669, Cl. 250-311.000.
Kaneko, Takashi; and Iwasaka, Tatsuo, 4,044,860, Cl. 187-29.00R.
Masuda, Kenzo, 4,045,686, Cl. 307-355.000.
Moriyama, Shigeo; and Kawamura, Yoshio, 4,045,141, Cl. 356-156.000.
Nakano, Seizo; Oishi, Kazuaki; Kikuchi, Takehiro; and Suda, Syoetu, 4,045,634, Cl. 200-148.00B.
Nishihara, Motohisa; and Ito, Tetsuo, 4,045,767, Cl. 340-5.00R.
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.
Sakurai, Yo; Obayashi, Hidehito; and Gejyo, Tetsuo, 4,044,601, Cl. 73-23.000.
Sampei, Tohru, 4,045,744, Cl. 330-13.000.
Shimizu, Tsuyoshi; and Tabata, Katsuhiro, 4,044,984, Cl. 249-95.000.
Suda, Seiji, 4,044,733, Cl. 123-117.00R.
Suzuki, Ryuichi; and Suzuki, Takaji, 4,045,655, Cl. 235-92.0PC.
Tachibana, Kyozo, 4,045,722, Cl. 363-126.000.
Yamazaki, Eiichi; and Kanai, Hiromi, 4,045,224, Cl. 96-36.100.
Hitco: *See*—
Babayan, Eduard P.; and Rourke, Michael H., 4,045,527, Cl. 264-46.700.
Hitzman, Donald O., to Phillips Petroleum Company. Integrated fermentation-photosynthesis biomass process. 4,044,500, Cl. 47-1.400.
Hlaban, James J.: *See*—
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Bernardin, Leo J., 4,044,766, Cl. 128-285.000.
Hochtemperatur-Reactorbau GmbH.: *See*—
Baumgaertner, Heinrich; and Barchewitz, Ekkehard, 4,045,285, Cl. 176-39.000.
Hocker, Jurgen: *See*—
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H.
Hodes, Isidore, to General Motors Corporation. Method of operation of a cupola. 4,045,212, Cl. 75-40.000.
Hodge, John S. Building structure. 4,044,518, Cl. 52-301.000.
Hodges, Newton John: *See*—
Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, 4,045,380, Cl. 260-2.5HA.
Hoechst Aktiengesellschaft: *See*—
Finke, Manfred; Kleiner, Hans-Jerg; and Lohmar, Elmar, 4,045,480, Cl. 260-545.00P.
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Bytzek, Max, 4,045,239, Cl. 106-147.000.
Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, 4,045,428, Cl. 260-198.000.
Mengler, Helmut, 4,045,169, Cl. 8-1.00W.
Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Albert, 4,045,295, Cl. 203-79.000.
Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, 4,045,415, Cl. 260-67.0FP.
Hoffmann-La Roche Inc.: *See*—
Cassal, Jean-Marie; Furst, Andor; and Meier, Werner, 4,045,490, Cl. 260-590.0FA.
Chan, Ka-Kong; and Saucy, Gabriel, 4,045,475, Cl. 260-488.00H.
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,045,487, Cl. 260-570.50C.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,045,452, Cl. 260-345.90S.
Koff, Arnold, 4,045,383, Cl. 260-8.000.
Rosenberger, Michael, 4,045,476, Cl. 260-488.00R.
Hohn, Alfred, to BBC Brown Boveri & Company Limited. Steam turbine having bearing structures lubricated with steam condensate in recirculating system. 4,044,561, Cl. 60-657.000.
Holden, Harold C.: *See*—
Claxton, William E.; and Holden, Harold C., 4,044,600, Cl. 73-15.00R.
Holec, N.V.: *See*—
Brinkman, Willem; and Breunkink, Bernard, 4,044,745, Cl. 123-139.00E.
Holiday Rambler Corporation: *See*—
Klingler, Richard, 4,044,410, Cl. 5-9.00R.
Hollingsead-Pryor Enterprises, Inc.: *See*—
Hollingsead, Robert A.; and Pryor, Clyde Robert, 4,044,515, Cl. 52-173.00R.
Hollingsead, Robert A.; and Pryor, Clyde Robert, to Hollingsead-Pryor Enterprises, Inc. Gasket for an avionic tray. 4,044,515, Cl. 52-173.00R.
Hollis, Richard E.: *See*—
Coombs, Donald L.; and Hollis, Richard E., 4,045,158, Cl. 431-123.000.
Holper, Frank, to Original Equipment Motors. Cam-operated motor control switch assembly with improved auxiliary actuator for motor control microswitch. 4,045,626, Cl. 200-30.00R.
Holstead, Robert D.: *See*—
Wyman, Charles E.; and Holstead, Robert D., 4,045,354, Cl. 210-523.000.

Holub, Arnold Emeral. Tractor-mounted scraper. 4,044,843, Cl. 172-802.000.
Hommer, Martin H.: *See*—
Rodondi, Andrew F.; and Hommer, Martin H., 4,045,112, Cl. 339-99.00R.
Honeywell Inc.: *See*—
Lee, Tzuo-Chang, 4,045,115, Cl. 350-3.500.
Spethmann, Donald H., 4,044,947, Cl. 236-13.000.
Honeywell Information Systems Inc.: *See*—
Lee, Fred S.; and Neu, William F., 4,045.786, Cl. 34. 174.0TF.
Hood, Harry N. Vertically slotted strainer. 4,044,409, Cl. 4-292.000.
Hooker Chemicals & Plastics Corporation: *See*—
Fuller, Willard A., 4,045,542, Cl. 423-478.000.
Hoover Ball and Bearing Company: *See*—
Nichols, Dwight E., 4,044,912, Cl. 220-63.00R.
Hopfer, Walter: *See*—
Burkert, Walter; Hopfer, Walter; and Grasmugg, Karl, 4,045,643, Cl. 219-98.000.
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., to Carrier Corporation. Refuse container. 4,044,914, Cl. 220-93.000.
Hopp, Philip, to Hopp Press, Inc., The. Display sign with edge attaching flange members. 4,044,485, Cl. 40-324.000.
Hopp Press, Inc., The: *See*—
Hopp, Philip, 4,044,485, Cl. 40-324.000.
Horlacher, Albert F., to Lock-A-Bike, Inc. Anti-theft device for portable apparatus. 4,044,577, Cl. 70-234.000.
Horowski, Reinhard: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.
Horst, William R.; McNaughton, James L.; and Mort, Charles F., to NCR Corporation. Method of fabricating diffraction grating masters and apparatus therefor. 4,044,939, Cl. 228-176.000.
Horstmann, Harald: *See*—
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,045,571, Cl. 424-273.00P.
Hoshide, Itsuo, to Teijin Seiki Company Limited. Arrangement of strand twisting apparatuses. 4,044,538, Cl. 57-62.000.
Hostetler, Dewey L., to DewEze Mfg., Inc. Round bale loader, unloader and unroller. 4,044,963, Cl. 242-54.00R.
Hotta, Atsuo, to Hitachi, Ltd. Oxide film isolation process. 4,045,249, Cl. 148-1.500.
Hou, Shou L.; and Blades, John D., to Addressograph-Multigraph Corporation. Duplicating apparatus employing modulator screen cylinder. 4,044,671, Cl. 101-129.000.
Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel: *See*—
Preuss, Arnfried, 4,044,613, Cl. 73-362.0AR.
Howard, George W., to Leisure Manufacturing Co., Inc. Airstream deflector for trailer-tow vehicle combinations. 4,045,074, Cl. 296-1.00S.
Howland, Robert Franklin; Mansky, Michael Herman; and Richards, Willie James, to General Foods Corporation. Soluble coffee of improved stability and flavor. 4,045,586, Cl. 426-387.000.
Howmedica, Inc.: *See*—
D'Errico, Joseph, 4,044,403, Cl. 3-1.913.
Hoyte, Alfred F.: *See*—
Chiang, Bing; and Hoyte, Alfred F., 4,045,638, Cl. 219-10.55A.
Hrishikesan, Kizhakke G., to Reynolds Metals Company. Process for recovering soda and alumina values from red mud. 4,045,537, Cl. 423-119.000.
Hsu, Grace F.: *See*—
Fong, Jaan-Jiue; and Hsu, Grace F., 4,045,305, Cl. 204-50.00R.
Hsu, Sheng Teng, to RCA Corporation. Complementary field effect transistor amplifier. 4,045,747, Cl. 330-35.000.
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., to Kennecott Copper Corporation. In-situ mining of copper and nickel. 4,045,084, Cl. 299-4.000.
Huang, I-Der: *See*—
Sherwin, Martin B.; and Huang, I-Der, 4,045,477, Cl. 260-497.00R.
Hubbs, John C.: *See*—
Worcester, John L.; and Hubbs, John C., 4,045,735, Cl. 324-158.00F.
Huber, Peter: *See*—
Sommer, Oswin; Huber, Peter; and Strasser, Alois, 4,045,602, Cl. 427-386.000.
Hudson, John H.: *See*—
Ferrary, Ferdinand F.; Johnson, Herman T.; and Hudson, John H., 4,045,334, Cl. 209-141.000.
Hudson, William Ronald, to Milford-Astor Limited. Printing mechanism. 4,044,676, Cl. 101-297.000.
Huff, Ray V.: *See*—
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,045,084, Cl. 299-4.000.
Huggins, James A. Gas humidification apparatus. 4,045,525, Cl. 261-124.000.
Hughes Aircraft Company: *See*—
Burke, Roger A., 4,044,542, Cl. 58-23.00R.
Tang, Raymond; and Wong, Nam San, 4,045,800, Cl. 343-854.000.
Humbert, Kingsley E., Jr., to Wix Corporation. Filter with multiple attaching means. 4,045,349, Cl. 210-232.000.
Humphries, Stanley, Jr.; and Sudan, Ravindra N., to Cornell Research Foundation, Inc. Intense ion beam generator. 4,045,677, Cl. 250-423.00R.
Hunger, Klaus: *See*—
Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, 4,045,428, Cl. 260-198.000.
Hunter, Frank Ray, to Du Pont de Nemours, E. I., and Company. Crystalline azopyrazolone acid dye. 4,045,425, Cl. 260-163.000.
Huntington Mechanical Laboratories, Inc.: *See*—
Alton, Lynn J., 4,044,918, Cl. 220-314.000.
Hurst, Robert E.; and Lunsford, Charles L., to Dow Chemical Company, The. Subsidence control. 4,044,563, Cl. 61-35.000.
Husen, William C.: *See*—
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.
Husqvarna Aktiebolag: *See*—
Giesselmann, Hannes; and Rendahl, Karl Ingvar Fredrik, 4,044,701, Cl. 112-259.000.
Hutson, Thomas, Jr.; and Kraus, Wayne P., to Phillips Petroleum Company. Alkyl fluoride storage stabilization and alkylation with stored alkyl fluoride. 4,045,503, Cl. 260-652.50P.
Hutton, James C.; Bauman, Thomas G.; and Rowlands, Kenneth C., to Remington Arms Company, Inc. Rotary port cover. 4,044,487, Cl. 42-16.000.
Hutton, Thomas W.: *See*—
Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., 4,045,517, Cl. 260-901.000.
Hybud Equipment Corporation: *See*—
Budoff, Hyman, 4,044,664, Cl. 100-48.000.
Hydril Company: *See*—
Crask, Geoffrey J., 4,044,473, Cl. 33-333.000.
Mott, James D., 4,044,835, Cl. 166-322.000.
Hydrocarbon Research, Inc.: *See*—
Johanson, Edwin S.; and Wolk, Ronald H., 4,045,329, Cl. 208-10.000.
HydroTech International, Inc.: *See*—
Arnold, James F., 4,045,054, Cl. 285-18.000.
Bowen, Burlie R.; Barrington, Claud C.; Ames, Thomas J.; and Lochte, Glen E., 4,044,749, Cl. 125-23.00R.
I.GE.Co. Z.r.l.: *See*—
Bianchi, Giuseppe, 4,045,236, Cl. 106-88.000.
I-T-E Imperial Corporation: *See*—
Schienda, John W., 4,045,628, Cl. 200-50.00C.
Iacono, Frederick Della, to Kings Electronics Company, Inc. Connector safety tip. 4,045,113, Cl. 339-111.000.
Ichinose, Noboru; Yokomizo, Yuji; and Katsura, Masaki, to Tokyo Shibaura Electric Co., Ltd. Gas-sensing material. 4,045,764, Cl. 338-34.000.
Iga, Atsushi: *See*—
Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, 4,045,178, Cl. 23-254.00E.
Igarashi, Jun; Koga, Tadao; and Ueda, Satoshi, to Yaesu Rehabili Co., Ltd. Foldable wheel chair. 4,045,051, Cl. 280-644.000.
Iglio, Salvatore: *See*—
Greenwald, Harry; and Iglio, Salvatore, 4,044,875, Cl. 194-1.00K.
Iida, Masajiro; Morimatsul, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, to Furuno Electric Company, Limited. Ultrasonic detection system. 4,045,766, Cl. 340-1.00R.
Iida, Yozo, to Nippon Kogaku, K.K. Film rewinding device for movie camera. 4,045,132, Cl. 352-91.00C.
Iio, Katsuro; and Osato, Akiyoshi, to Kobe Steel, Limited. Automatic arc welding process using a consumable nozzle. 4,045,648, Cl. 219-137.00R.
Ikeda, Morio, to Teijin Limited. Process for producing textured polyester multifilament yarn. 4,044,541, Cl. 57-157.0TS.
Ikeda, Tomoaki: *See*—
Shinozaki, Fumiaki; Ikeda, Tomoaki; and Tsuboi, Masayoshi, 4,045,222, Cl. 96-33.000.
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, to Kabushiki Kaisha Daini Seikosha. Switching mechanism of an electronic wrist watch. 4,044,543, Cl. 58-23.00R.
Ikenoue, Shinpei; and Mizuki, Eiichi, to Fuji Photo Film Co., Ltd. Method for stabilizing silver halide photographic material. 4,045,227, Cl. 96-61.00R.
Illinois Tool Works Inc.: *See*—
Sidor, Edward Frank; Camillo, Charles Carl; and Bowen, Glenn W., 4,045,787, Cl. 340-197.000.
Imamura, Masao. Sliding resistor. 4,045,765, Cl. 338-176.000.
Imasco Limited: *See*—
Lafleur, Roger, 4,044,526, Cl. 53-26.000.
Imoehl, Wolfgang: *See*—
Drawert, Manfred; Griebsch, Eugen; and Imoehl, Wolfgang, 4,045,389, Cl. 260-18.00N.
Imon, Kazutoshi, to Kabushiki Kaisha Komatsu Seisakusho. Steering control apparatus for use in endless track type tractors and control valve for use ·' 3rewith. 4,044,849, Cl. 180-6.700.
Imperial Chemical Industries Limited: *See*—
Martin, Graham Ernest; Cockshott, Ian Derek; and Fildes, Francis James Thomas, 4,044,404, Cl. 3-19.000.
Preston, John; and Reeve, Austin John, 4,045,439, Cl. 260-250.00C.
Inada, Masami; and Kitamura, Kazuhiko, to Aisin Seiki Kabushiki Kaisha. Pneumatic control system and pressure responsive valve assembly therefor. 4,044,732, Cl. 123-117.00A.
Indian Head, Inc.: *See*—
Francis, Orville, 4,044,983, Cl. 248-293.000.

Ingersoll-Rand Company: *See*—
Fischer, Robert B., 4,045,256, Cl. 148-36.000.
Ingram, Alexander John. Fishing lure. 4,044,492, Cl. 43-42.280.
Innami, Tamio: *See*—
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.
Innes, Robert A.; and Perrotta, Anthony J., to Gulf Research & Development Company. Oxidation catalysts and process for preparing same. 4,045,373, Cl. 252-469.000.
Inoue, Shuji: *See*—
Isaka, Tsutomu; Inoue, Shuji; and Arakawa, Kunihiko, 4,045,515, Cl. 260-897.00A.
Institut Francais du Petrole: *See*—
Avrillon, Rene; and Defives, Daniel, 4,045,330, Cl. 208-180.000.
Provost, Roger, 4,044,717, Cl. 118-629.000.
Rabilloud, Guy; and Sillion, Bernard, 4,045,414, Cl. 260-65.000.
Instrument Services, Inc.: *See*—
Castelli, Joseph T.; Forrester, Joseph J.; and Symosko, Stephen, 4,045,788, Cl. 340-323.00R.
Instrumentation Industries, Inc.: *See*—
Eross, Bela, 4,045,058, Cl. 285-119.000.
International Business Machines Corporation: *See*—
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,044,452, Cl. 29-571.000.
Arnold, Robert Walker; and Tomasky, Thomas, 4,045,770, Cl. 346-75.000.
Carpenter, Robert Gordon; and Chao, Chester C., 4,045,736, Cl. 324-158.00R.
Chai, Hi Dong; and Pawletko, Joseph Paul, 4,044,881, Cl. 197-82.000.
Fujikura, Hiroshi, 4,045,821, Cl. 360-132.000.
Hill, Thomas; Kennedy, Ambrose; and Thomson, Walter Grey, 4,044,937, Cl. 225-97.000.
Lutz, Heinz; Zimmermann, Volker; and Zuehlke, Rainer, 4,045,696, Cl. 310-49.00R.
Maddocks, Fred Sterns, 4,045,594, Cl. 427-89.000.
Magdo, Ingrid E., 4,044,454, Cl. 29-578.000.
Martin, Blair Robertson, 4,044,880, Cl. 197-18.000.
International Flavors & Fragrances Inc.: *See*—
Evers, William J.; and Heinsohn, Howard H., Jr., 4,045,491, Cl. 260-594.000.
Katz, Ira; Pittet, Alan O.; Wilson, Richard Arnold; and Evers, William John, 4,045,587, Cl. 426-533.000.
Schreiber, William L.; and Pittet, Alan O., 4,045,497, Cl. 260-615.00A.
Wiegers, Wilhelmus Johannen; and Hall, John B., 4,045,489, Cl. 260-586.00C.
International Nickel Company, Inc., The: *See*—
Mercer, David L., 4,045,541, Cl. 423-417.000.
International Paper Company: *See*—
Burt, George A., Jr.; and Neill, William M., 4,044,641, Cl. 83-341.000.
International Telephone and Telegraph Corporation: *See*—
Coombs, Donald L.; and Hollis, Richard E., 4,045,158, Cl. 431-123.000.
Langenbach, Jack E.; and Hawkins, John L., 4,045,109, Cl. 339-75.00M.
Peterson, Carl W., 4,045,111, Cl. 339-97.00R.
Pitt, Gillies D.; and Black, Philip W., 4,045,668, Cl. 250-227.000.
INTERx Research Corporation: *See*—
Kaminski, James J.; and Bodor, Nicolae S., 4,045,578, Cl. 424-311.000.
Invernati, Carlo, to Danyel S.A.S. Supporting and pivot device made of plastic for keys of pianos, electronic organs and the like. 4,044,646, Cl. 84-435.000.
IPCO Hospital Supply Corporation: *See*—
Beckman, Paul, 4,044,614, Cl. 73-371.000.
Ireland, Henry R.; Peters, Alan W.; and Stein, Thomas R., to Mobil Oil Corporation. Method for upgrading a Fischer-Tropsch light oil. 4,045,505, Cl. 260-673.000.
Irwin, Clarence C., to General Motors Corporation. Trailing arm cambering vehicle with stabilizer linkage having locking means for parking and stowage. 4,045,048, Cl. 280-278.000.
Isaka, Tsutomu; Inoue, Shuji; and Arakawa, Kunihiko, to Toyo Boseki Kabushiki Kaisha. Film of good tear property on impact. 4,045,515, Cl. 260-897.00A.
Isayama, Takuro: *See*—
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, 4,045,802, Cl. 346-140.00R.
Ishida, Kunio, to Tokico Ltd. Method for filling gas into gas spring. 4,044,866, Cl. 188-322.000.
Ishigaki Kiko Co., Ltd.: *See*—
Yokota, Ittshu, 4,045,344, Cl. 210-156.000.
Ishii, Masaichi; and Mihara, Kazuo, to Daicel Ltd. Tube scrubbing apparatus. 4,044,418, Cl. 15-104.06A.
Ishikawa, Fumio: *See*—
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.
Ishikawa, Kazuo: *See*—
Miyamoto, Mamoru; and Ishikawa, Kazuo, 4,045,763, Cl. 338-23.000.
Isii, Masami: *See*—
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.
Isobe, Yasuo: *See*—
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, 4,045,807, Cl. 354-38.000.
Isteri, Pauli Henrik. Method and device for oxygenating water with vibrations and under pressure strokes. 4,045,336, Cl. 210-15.000.
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, to Pioneer Electronic Corporation; and Tokorozawa Electronic Corporation. Piezoelectric electro-acoustic transducer. 4,045,695, Cl. 310-322.000.
Itek Corporation: *See*—
Cronin, Paul W.; Ottmar, Peter H.; Root, Ernest F.; and Simmons, Harry M., 4,044,754, Cl. 126-271.000.
Itil, Turan M.; and Herrmann, Werner Martin, to Schering Aktiengesellschaft. Lisuride and physiologically acceptable salts thereof to achieve psychic energizer effects. 4,045,562, Cl. 424-261.000.
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, to Canon Kabushiki Kaisha. Automatic exposure control apparatus which prevents simultaneous diaphragm and shutter speed preselection. 4,045,807, Cl. 354-38.000.
Ito, Tadashi: *See*—
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, 4,045,807, Cl. 354-38.000.
Ito, Tetsuo: *See*—
Nishihara, Motohisa; and Ito, Tetsuo, 4,045,767, Cl. 340-5.00R.
Itoh, Kunio; and Fukuda, Takeshi, to Shin-Etsu Chemical Co., Ltd. Silicone rubber compositions. 4,045,390, Cl. 260-18.00S.
Itoh, Masaaki: *See*—
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.
Itoh, Tsunehiro: *See*—
Hamada, Koichi; Kikubu, Kaoru; and Itoh, Tsunehiro, 4,044,447, Cl. 29-419.00R.
ITT Industries, Incorporated: *See*—
Gehrig, Wilfried W., 4,045,685, Cl. 307-208.000.
Iwahashi, Shunji; Morizane, Fukuichi; and Kato, Yasuyuki, to Sumitomo Chemical Company, Limited. Thermoplastic resin composition comprising methyl methacrylate resins and a polycarbonate. 4,045,514, Cl. 260-873.000.
Iwama, Kiyonori: *See*—
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,045,695, Cl. 310-322.000.
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, to Nippon Carbon Co., Ltd.; and Japan Atomic Energy Research Institute. Process for the preparation of graphite-clad nuclear fuel rods. 4,045,526, Cl. 264-.500.
Iwasaka, Tatsuo: *See*—
Kaneko, Takashi; and Iwasaka, Tatsuo, 4,044,860, Cl. 187-29.00R.
Iwasaki, Hiroshi: *See*—
Kondo, Mitsura; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,045,458, Cl. 260-393.000.
Iwasaki, Kyuhachiro, to Ricoh Company, Ltd. Ink ejection head for printer. 4,045,801, Cl. 346-140.00R.
Iwasaki, Kyuhachiro: *See*—
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, 4,045,802, Cl. 346-140.00R.
Iwata, Toyomi: *See*—
Taniguchi, Motoaki; and Iwata, Toyomi, 4,044,810, Cl. 152-209.00R.
Izawa, Toichiro: *See*—
Daimon, Nobutoshi; and Izawa, Toichiro, 4,045,241, Cl. 106-306.000.
J. M. Huber Corporation: *See*—
Wason, Satish K.; and van der Heem, Peter, 4,045,240, Cl. 106-288.00B.
J. Walter AG: *See*—
Walter, Josef, 4,045,042, Cl. 280-79.10R.
Jacks, Roy T., to U.S. Manufacturing Corporation. Torsional damper. 4,044,628, Cl. 74-574.000.
Jackson, John Lambert: *See*—
Archibald, John Leheup; and Jackson, John Lambert, 4,045,566, Cl. 424-267.000.
Jackson, John Maxwell, to Chromax Limited. Mandrels for supporting containers with negative and positive air pressure. 4,044,667, Cl. 101-38.00R.
Jackson, Melvin R., to United States of America, National Aeronautics and Space Administration. Directionally solidified eutectic $\gamma+\beta$ nickel-base superalloys. 4,045,255, Cl. 148-32.000.
Jacobs, Alfred G. Athletic mouthguard. 4,044,762, Cl. 128-136.000.
Jacobs, Brigitte: *See*—
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.
Jacobs, Klaus: *See*—
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.
Jacobsen, Theodor: *See*—
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.
Jagenberg Werke AG: *See*—
Vetten, Wilhelm, 4,044,656, Cl. 93-44.1GT.
Jagenberg Werke Aktiengesellschaft: *See*—
Zodrow, Rudolf, 4,045,276, Cl. 156-571.000.
Jago, Donald F.: *See*—
Jones, Richard E.; and Jago, Donald F., 4,044,714, Cl. 118-24.000.
Jones, Richard E.; and Jago, Donald F., 4,045,584, Cl. 426-289.000.

Jakob, Hans, to Maschinenfabrik Goebel GmbH. Adjustable folding apparatus for zigzag folding. 4,045,012, Cl. 270-79.000.
Jambor, Arno: *See—*
Wilfert, Karl; Schmid, Walter; and Jambor, Arno, 4,045,052, Cl. 280-701.000.
James A. Jobling & Company Limited: *See—*
Obersby, Derek; and Allen, Thomas Kenneth, 4,044,936, Cl. 225-2.000.
James, Dennis Bryan; Liu, Chao Kai; and Smith, Douglas Charles, to Bell Telephone Laboratories, Incorporated. Monobus interface circuit using opto-coupled hybrids. 4,045,615, Cl. 179-1.0CN.
Jamieson, Robert S. High efficiency aerodynamic sail system for boats, and method for sailing. 4,044,702, Cl. 114-102.000.
Jamison, Leon L., to Raymond Lee Organization, Inc., The, a part interest. Aerial distress marker. 4,044,711, Cl. 116-124.00B.
Janson, Sven-Olof. Device for preventing overheating of electric apparatuses. 4,045,652, Cl. 219-363.000.
Janssen, Hendrik Jan Jacob: *See—*
Dudek, Thomas J.; Marker, Leon F.; and Janssen, Hendrik Jan Jacob, 4,044,811, Cl. 152-354.000.
Janssen, Peter Johannes Michiel: *See—*
Verhoeven, Leonardus Adrianus Johannes; De Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, 4,045,812, Cl. 358-4.000.
Japan Atomic Energy Research Institute: *See—*
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, 4,045,526, Cl. 264-.500.
Jaremus, Boubene M.: *See—*
Goodman, Manuel; and Jaremus, Boubene M., 4,044,712, Cl. 116-142.0FP.
Jawanda, Jasjit S.: *See—*
Habert, William C.; and Jawanda, Jasjit S., 4,045,277, Cl. 156-417.000.
Jaworski, Eugene: *See—*
Breslow, Jeffrey D.; Jaworski, Eugene; and Sakoda, Tom Kenzo, 4,045,024, Cl. 273-43.00A.
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, to Cadbury Limited. Method of manufacturing a chocolate product. 4,045,583, Cl. 426-241.000.
Jenoff, Incorporated: *See—*
Peterson, Reuben E., 4,045,761, Cl. 337-372.000.
Jenoptik Jena G.m.b.H.: *See—*
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.
Jeno's, Inc.: *See—*
Jones, Richard E.; and Jago, Donald F., 4,044,714, Cl. 118-24.000.
Jones, Richard E.; and Jago, Donald F., 4,045,584, Cl. 426-289.000.
Jepson, Walter Brian: *See—*
Bidwell, Jan Ivan; Adams, Roger William; and Jepson, Walter Brian, 4,045,235, Cl. 106-72.000.
Jernstrom, Hans. Bubble blower. 4,044,496, Cl. 46-7.000.
Jero, John P.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,045,402, Cl. 260-42.180.
Jervis B. Webb Company: *See—*
Melke, George A., 4,044,853, Cl. 180-98.000.
Jessup, Robert L.; and Coleman, Joe E., to Halliburton Company. Method and apparatus for annulus pressure responsive circulation and tester valve manipulation. 4,044,829, Cl. 166-264.000.
Jidosha Kiki Co., Ltd.: *See—*
Yanagawa, Itiro; and Suzuki, Isao, 4,045,094, Cl. 303-22.00R.
Jofs, Jar-Erik, to Oy Wiik & Hoglund Ab. Method of and apparatus for making a non-slip plastics film. 4,045,270, Cl. 156-229.000.
Joh. Vaillant K.G.: *See—*
Reichmann, Horst, 4,044,726, Cl. 122-33.000,
Johansen, Randulf Inge, to A/S Trondhjems Nagle & Spigerfabrik. Method for in situ determination of concrete strength. 4,044,608, Cl. 73-88.00C.
Johanson, Edwin S.; and Wolk, Ronald H., to Hydrocarbon Research, Inc. Coal hydrogenation with selective recycle of liquid to reactor. 4,045,329, Cl. 208-10.000.
John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,045,566, Cl. 424-267.000.
Cavalla, John Frederick; and Archibald, John Leheup, 4,045,444, Cl. 260-293.580.
Johns-Manville Corporation: *See—*
Meserole, Robert Henry, 4,044,581, Cl. 72-68.000.
Johnson, Arthur C. W., to Combustion Research Corporation. Radiant energy heating system with power exhaust and excess air inlet. 4,044,751, Cl. 126-91.00A.
Johnson Controls, Inc.: *See—*
Matthews, Russell Byron, 4,044,794, Cl. 137-613.000.
Johnson, Herman T.: *See—*
Ferrary, Ferdinand F.; Johnson, Herman T.; and Hudson, John H., 4,045,334, Cl. 209-141.000.
Johnson, John H.: *See—*
Weeks, Lloyd E.; Johnson, John H.; and Reents, Margaret J., 4,045,297, Cl. 195-103.50R.
Johnson & Johnson: *See—*
Frydryk, John, 4,044,501, Cl. 47-26.000.
Mesek, Frederick K.; and Repke, Virginia L., 4,044,768, Cl. 128-287.000.
Tritsch, Ludwig, 4,044,767, Cl. 128-287.000.
Johnson, Larry K., to Lawrence Brothers, Inc. Releasable door stop and strike plate assembly for a bidirectional swinging door. 4,045,065, Cl. 292-341.170.
Johnson, Robert A., to Fasco Industries, Inc. Thermostatic switch. 4,045,757, Cl. 337-85.000.
Jones, Arfon Harry; Swolfs, Henri Samuel; and Green, Sidney Joseph, to Terra Tek, Inc. Process for direct measurement of the orientation of hydraulic fractures. 4,044,828, Cl. 166-250.000.
Jones, Christopher Robin: *See—*
Williams, Malcolm; and Jones, Christopher Robin, 4,044,738, Cl. 123-119.00A.
Jones, Richard E.; and Jago, Donald F., to Jeno's, Inc. Food product coating apparatus. 4,044,714, Cl. 118-24.000.
Jones, Richard E.; and Jago, Donald F., to Jeno's, Inc. Food product coating apparatus and method. 4,045,584, Cl. 426-289.000.
Jones, Richard F., to General Aquadyne, Inc. Method of operating video cameras and lights underwater. 4,045,813, Cl. 358-99.000.
Jones, Robert K.; and Sue, Harry, to Teletype Corporation. Starting product for the production of a read-only memory and a method of producing it and the read-only memory. 4,045,310, Cl. 204-129.400.
Jones & Vining, Incorporated: *See—*
Cohen, Arnold, 4,044,417, Cl. 12-146.00L.
Josef Haamann, Hebe-und Transporttechnik, Firma: *See—*
Mai, Erich, 4,045,000, Cl. 254-45.000.
Judah, Kenneth C.: *See—*
Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 4,045,343, Cl. 210-101.000.
Judat, Artur; Judat, Helmut; and Grah, Gerd, to Bayer Aktiengesellschaft. Method for regulating the flow of liquid through mass transfer columns. 4,045,190, Cl. 55-93.000.
Judat, Helmut: *See—*
Judat, Artur; Judat, Helmut; and Grah, Gerd, 4,045,190, Cl. 55-93.000.
Jue, John. Shrub trimming guide. 4,044,472, Cl. 33-174.00G.
Jukoff, David, to Consolidated Controls Corporation. High energy loss fluid flow control device. 4,044,992, Cl. 251-126.000.
Junggren, Ulf Krister: *See—*
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,563, Cl. 424-263.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,564, Cl. 424-263.000.
Junghans, Rudi, to Heidelberger Druckmaschinen Aktiengesellschaft. Dampening unit for offset printing machines. 4,044,673, Cl. 101-148.000.
Kabachnik, Martin Izrailevich: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Kabushiki Kaisha Daini Seikosha: *See—*
Asano, Kazuhiro, 4,045,691, Cl. 307-264.000.
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.
Koike, Mitsuo, 4,044,546, Cl. 58-50.00R.
Kusumoto, Yasuo, 4,044,547, Cl. 58-85.500.
Yagi, Kenjiro; and Asano, Kazuhiro, 4,044,544, Cl. 58-23.00R.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Imon, Kazutoshi, 4,044,849, Cl. 180-6.700.
Kabushiki Kaisha Negishi Kobyo Kenkyusho: *See—*
Negishi, Eizaburo; and Negishi, Masanori, 4,044,537, Cl. 57-58.890.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Bernardin, Leo J., to Kimberly-Clark Corporation. Compressed catamenial tampons with improved capabilities for absorbing menstrual fluids. 4,044,766, Cl. 128-285.000.
Kadota, Shozo; Fujimoto, Yoshiji; Yasuda, Michio; and Oka, Mitsunori, to Hitachi, Ltd. Pattern segmenting system for a pattern recognizing device. 4,045,773, Cl. 340-146.3SG.
Kaegi, Emil M.: *See—*
Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., 4,044,718, Cl. 118-647.000.
Kahn, Henry. Handle for cutting and abrading instruments useful in the practice of endodontia. 4,044,468, Cl. 32-57.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Ring, Terry A., 4,045,234, Cl. 106-62.000.
Schroter, Richard C., 4,044,517, Cl. 52-248.000.
Kaiser, Reinhold, to Licentia Patent-Verwaltungs-GmbH. Method of manufacturing a semiconductor device. 4,045,258, Cl. 148-187.000.
Kaiser Resources Ltd.: *See—*
Parkes, David M.; and Hart, Thomas Brian, 4,045,086, Cl. 299-17.000.
Kajfez, Franjo; Blazevic, Nikola; and Sunjic, Vitomir. Optically active 1,4-benzodiazepines and process for use as a tranquilizer. 4,045,569, Cl. 424-274.000.
Kaleel, Jack T. Arabic bread oven. 4,045,166, Cl. 432-146.000.

Kalkowski, Kurt Ulrich. Protective cover for an electric range. 4,045,606, Cl. 428-174.000.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Hair dye composition containing an indoaniline. 4,045,170, Cl. 8-11.000.

Kamimura, Shoji; and Saito, Yasushi, to Hitachi, Ltd. Electron microscope. 4,045,669, Cl. 250-311.000.

Kaminski, James J.; and Bodor, Nicolae S., to INTERx Research Corporation. N-chloro-amino acid derivatives exhibiting antibacterial activity. 4,045,578, Cl. 424-311.000.

Kanai, Hiromi: *See*—
Yamazaki, Eiichi; and Kanai, Hiromi, 4,045,224, Cl. 96-36.100.

Kaname, Yuichi; Nakajima, Masaya; and Tabuchi, Katumi, to Matsushita Electric Industrial Co., Ltd. Expendable oceanography probe. 4,044,611, Cl. 73-170.00A.

Kandakov, Gennady Petrovich; Matveev, Georgy Vasilievich; and Miller, Viktor Yakovlevich. Expansion compensator for pipelines. 4,045,056, Cl. 285-41.000.

Kane, Robert J. Pool models. 4,044,477, Cl. 35-49.000.

Kaneko, Takashi; and Iwasaka, Tatsuo, to Hitachi, Ltd. Elevator traffic demand detector. 4,044,860, Cl. 187-29.00R.

Kanner, Bernard: *See*—
Prokai, Bela; and Kanner, Bernard, 4,045,381, Cl. 260-2.5AH.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Kondo, Mitsura; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,045,458, Cl. 260-393.000.

Kaplan, Edward L.: *See*—
Cless, Gerhard; and Kaplan, Edward L., 4,044,946, Cl. 234-39.000.

Karasev, Alexandr Konstantinovich: *See*—
Mikhailov, Viktor Vasilievich; Litver, Semen Lvovich; and Karasev, Alexandr Konstantinovich, 4,045,533, Cl. 264-228.000.

Karasudani, Yasuo, to Tokico Ltd. Disc brake. 4,044,864, Cl. 188-73.300.

Karayannis, Panayotis, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Ignition current generator for an electrical projectile fuze. 4,044,682, Cl. 102-70.2GA.

Karl Handle & Sohne Maschinenfabrik und Eisengiesserei: *See*—
Gutjahr, Erwin, 4,044,958, Cl. 241-126.000.

Karlsson, Ronny, to Siemens Aktiengesellschaft. Sheet film magazine for an X-ray film exchanger. 4,045,014, Cl. 271-8.00R.

Kashio, Toshio, to Casio Computer Co., Ltd. Apparatus for arithmetically processing bill records. 4,045,780, Cl. 364-900.000.

Kato, Tetsuji, to Mitsubishi Rayon Co., Ltd. System for cutting pieces from a traveling strip of sheet material. 4,044,639, Cl. 83-7.000.

Kato, Yasuyuki: *See*—
Iwahashi, Shunji; Morizane, Fukuichi; and Kato, Yasuyuki, 4,045,514, Cl. 260-873.000.

Katori, Kunihiko; Nagai, Hiroshi; and Shiiki, Zenya, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Process for production of activated carbon spheres. 4,045,368, Cl. 252-421.000.

Katsube, Junki: *See*—
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,045,560, Cl. 424-248.400.

Katsuhiko, Motosugi: *See*—
Masaaki, Noguchi; Yukiyasu, Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, 4,044,730, Cl. 123-75.00B.

Katsura, Masaki: *See*—
Ichinose, Noboru; Yokomizo, Yuji; and Katsura, Masaki, 4,045,764, Cl. 338-34.000.

Katz, Ira; Pittet, Alan O.; Wilson, Richard Arnold; and Evers, William John, to International Flavors & Fragrances Inc. Foodstuff flavoring methods and compositions. 4,045,587, Cl. 426-533.000.

Katzmark, Peter C. Aerodynamic orificed disc. 4,045,029, Cl. 273-106.00B.

Kawamoto, Isao: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.

Kawamura, Yoshio: *See*—
Moriyama, Shigeo; and Kawamura, Yoshio, 4,045,141, Cl. 356-156.000.

Kawanishi, Yasuhiro: *See*—
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.

Kawasaki, Kazuo, to Nissan Denshi Kabushikigaisha. Combined transceiver and radio unit. 4,045,739, Cl. 325-15.000.

Kawolics, Raymond P.: *See*—
Basel, Donald R.; and Kawolics, Raymond P., 4,044,989, Cl. 251-7.000.

Kaye, Marie: *See*—
Kaye, Ronald Swynerton, 4,044,746, Cl. 123-139.0AV.

Kaye, Ronald Swynerton, to Kaye, Marie, a part interest. Fuel control device. 4,044,746, Cl. 123-139.0AV.

Keefer, James J. Internal combustion engine fuel economizer system. 4,044,744, Cl. 123-136.000.

Kehr, Clifton Leroy: *See*—
Guthrie, James Leverette; and Kehr, Clifton Leroy, 4,045,472, Cl. 260-471.00C.

Kehr, Wolfgang: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Keller Corporation, The: *See*—
Keller, Leonard J., 4,045,092, Cl. 302-66.000.

Keller, Leonard J., to Keller Corporation, The. Fuel composition and method of manufacture. 4,045,092, Cl. 302-66.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for floating melt zone of semiconductor crystal rods. 4,045,278, Cl. 156-602.000.

Keller, Wolfgang: *See*—
Barowski, Gerhard; Keller, Wolfgang; and Schroetter, Gerhard, 4,045,183, Cl. 23-273.0SP.

Kellett, William B., to Pako Corporation. Roll holder for photographic processors. 4,044,964, Cl. 242-58.000.

Kelly, Donald A. Rotary closed series cycle engine system. 4,044,559, Cl. 60-525.000.

Kelly, James G., to American Brands, Inc. Apparatus for total blend expansion. 4,044,780, Cl. 131-135.000.

Kelly, Ralph; and Ritter, Edmond Jean, to Cincinnati Milacron Inc. Skin protective compositions. 4,045,550, Cl. 424-70.000.

Kemira Oy: *See*—
Renvall, Ilkka; and Mattila, Tapio, 4,045,453, Cl. 260-347.400.

Kendall Company, The: *See*—
McWhorter, Daniel M.; and Patel, Bhupendra C., 4,044,757, Cl. 128-2.00A.
Patel, Bhupendra C., 4,044,758, Cl. 128-2.00A.

Kennametal Inc.: *See*—
Kennicott, Wilbur L., 4,044,655, Cl. 92-258.000.

Kennecott Copper Corporation: *See*—
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,045,084, Cl. 299-4.000.

Kennedy, Ambrose: *See*—
Hill, Thomas; Kennedy, Ambrose; and Thomson, Walter Grey, 4,044,937, Cl. 225-97.000.

Kennedy, Leverne H.: *See*—
Heffron, Allan J.; and Kennedy, Leverne H., 4,044,638, Cl. 82-9.000.

Kennicott, Wilbur L., to Kennametal Inc. High pressure plunger and method of manufacture. 4,044,655, Cl. 92-258.000.

Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, to Schering Aktiengesellschaft. D-Homo-20-ketopregnanes. 4,045,574, Cl. 424-303.000.

Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., to Otis Engineering Corporation. Apparatus for treating wells. 4,044,827, Cl. 166-133.000.

Keske, Robert G.; and Stephens, James R., to Standard Oil Company (Indiana). Process for preparing amideimide polymers in the presence of alcoholic solvent. 4,045,407, Cl. 260-47.0CP.

Khan, Mohammed Moiz Uddin: *See*—
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,045,583, Cl. 426-241.000.

Kieger, Roger: *See*—
Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, 4,045,213, Cl. 75-48.000.

Kiener, Heinz, to SKF Industrial Trading and Development Company, B. V. Hydraulically operated clutch release bearing. 4,044,871, Cl. 192-91.00A.

Kieslich, Klaus: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Kikubu, Kaoru: *See*—
Hamada, Koichi; Kikubu, Kaoru; and Itoh, Tsunehiro, 4,044,447, Cl. 29-419.00R.

Kikuchi, Kazuo: *See*—
Takeda, Hideomi; and Kikuchi, Kazuo, 4,045,804, Cl. 354-25.000.

Kikuchi, Takehiro: *See*—
Nakano, Seizo; Oishi, Kazuaki; Kikuchi, Takehiro; and Suda, Syoetu, 4,045,634, Cl. 200-148.00B.

Kilgus, Donald C., deceased; and by Kilgus, Marjorie M., executrix. Vehicle tie-down system for rail cars. 4,044,691, Cl. 105-368.00T.

Kilgus, Marjorie M., executrix: *See*—
Kilgus, Donald C., deceased; and Kilgus, Marjorie M., executrix, 4,044,691, Cl. 105-368.00T.

Kim, Dong Wha: *See*—
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 4,045,534, Cl. 264-237.000.

Kimberly-Clark Corporation: *See*—
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Bernardin, Leo J., 4,044,766, Cl. 128-285.000.

Kimura, Hideyuki: *See*—
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.

Kimura, Takeshi: *See*—
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.

King, Arthur Shelley. Suspended solids extraction system and method. 4,045,326, Cl. 204-299.00R.

King, Dwayne L. Camera mounted flash extender and power pack therefor. 4,045,808, Cl. 354-126.000.

Kings Electronics Company, Inc.: *See*—
Iacono, Frederick Della, 4,045,113, Cl. 339-111.000.

Kingsley, Jack D.; and Woodbury, Henry H., to General Electric Company. Solid state radiation detector system. 4,045,675, Cl. 250-370.000.

Kinney, C. Mills, Jr., to Wire Conveyor Belts, Inc. Method and apparatus for making elongated flat wire coils. 4,044,583, Cl. 72-137.000.

Kinoshita, Yoshiaki: *See*—
Tsuruta, Hidemasa; Kinoshita, Yoshiaki; and Tanaka, Isao, 4,045,341, Cl. 210-45.000.

Kinugasa, Akikazu; Okuda, Toshio; Goto, Makoto; and Saito, Mitsuo, to Alps Pharmaceutical Ind. Co., Ltd. Optical resolution of DL-pantolactone. 4,045,450, Cl. 260-343.600.

Kiovsky, Thomas E.; and Wald, Milton M., to Shell Oil Company. High temperature methanation with molten salt-based catalyst systems. 4,045,461, Cl. 260-449.00M.

Kirchmayr, Rudolf: *See*—
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,045,518, Cl. 260-927.00R.

Kirjanov, Alexander: *See*—
Duncan, John J.; and Kirjanov, Alexander, 4,045,172, Cl. 8-115.700.

Kirkpatrick, James William, Jr., to American Microsystems, Inc. Sense amplifier for static memory device. 4,045,785, Cl. 340-173.00R.

Kisfaludy, Lajos: *See*—
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.

Kishino, Takao; and Utamura, Yukihiko, to Futaba Denshi Kogyo K. K. Multi-digit fluorescent display tube with differently spaced planar control grid sections. 4,045,704, Cl. 313-497.000.

Kita, Kazuharu, to Senyo Kiko Kabushiki Kaisha. Monorail transport apparatus. 4,044,688, Cl. 105-30.000.

Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kouzo; and Shinozaki, Nobuo, to Seiko Koki Kabushiki Kaisha. Switching mechanism for alarming time detection in an alarming device. 4,045,627, Cl. 200-37.00R.

Kitamura, Kazuhiko: *See*—
Inada, Masami; and Kitamura, Kazuhiko, 4,044,732, Cl. 123-117.00A.

Kjaergaard, Knud, to Odin Clorius A/S. Diaphragm operated pressure regulator. 4,044,792, Cl. 137-505.220.

Kleeberg, Wolfgang: *See*—
Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, 4,045,223, Cl. 96-35.100.

Klein, Alfons; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the preparation of 1,1,3,3-substituted hydroxy indanes. 4,045,499, Cl. 260-621.00R.

Klein, Elias: *See*—
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 4,045,352, Cl. 210-500.00M.

Klein, Gerd; and Schmoll, Kurt, to Dynamit Nobel Aktiengesellschaft. Free-flowing urea resin compositions with silane or siloxane additive added before hardening. 4,045,385, Cl. 260-15.000.

Klein, Herman C., to McDonnell Douglas Corporation. Transilluminated dial presentation. 4,044,708, Cl. 116-129.00P.

Kleiner, Hans-Jerg: *See*—
Finke, Manfred; Kleiner, Hans-Jerg; and Lohmar, Elmar, 4,045,480, Cl. 260-545.00P.

Kleinstuck, Roland, to Bayer Aktiengesellschaft. Preparation of aminoalkylsilanes. 4,045,460, Cl. 260-448.80R.

Klendauer, Wolfgang: *See*—
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Bytzek, Max, 4,045,239, Cl. 106-147.000.

Klimek, Boleslaw M., to Echlin Manufacturing Company, The. Low pressure selector. 4,045,768, Cl. 340-52.00C.

Kline, Arthur Jonathan, Jr., to Motorola, Inc. Correlation system for pseudo-random noise signals. 4,045,796, Cl. 343-6.50R.

Kline, William Mathes, to Medical Evaluation Devices and Instruments Corporation. Flexible tube for intra-venous feeding. 4,044,765, Cl. 128-214.400.

Klingenberg, Oystein F., to A. S. Skarpenord. Galvanic anode. 4,045,320, Cl. 204-197.000.

Klingler, Richard, to Holiday Rambler Corporation. Combination bunk bed and seat. 4,044,410, Cl. 5-9.00R.

Klotzer, Sieghart: *See*—
Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, 4,045,228, Cl. 96-64.000.

Knake, Ronald W.: *See*—
Thomas, Everett A.; and Knake, Ronald W., 4,045,233, Cl. 106-57.000.

Knapp, Paul William, Jr., to American Cyanamid Company. Alkyl allophanates, method for preparation and fungicidal use of the same. 4,045,470, Cl. 260-470.000.

Knawa, Robert L.: *See*—
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.

Knecht, William A.: *See*—
Marquis, Edgar E.; and Knecht, William A., 4,045,760, Cl. 337-301.000.

Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, to Bayer Aktiengesellschaft. Asymmetric, semipermeable membranes of cyclic polyureas. 4,045,337, Cl. 210-23.00H.

Kniese, Wilhelm; and Nienburg, Hans Juergen, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of aldehydes and alcohols. 4,045,492, Cl. 260-604.0HF.

Knight, Richard I.: *See*—
Smith, David H.; and Knight, Richard I., 4,045,705, Cl. 315-3.000.

Knopka, William N., to Avtex Fibers Inc. Ethylene 2,6-naphthalene dicarboxylated-alkylene-2,5 dibromoterephthalate flame-retardant copolyesters. 4,045,513, Cl. 260-860.000.

Knox Manufacturing Co.: *See*—
Brown, Donald J., 4,045,123, Cl. 350-117.000.

Knudsen, David S. Container closed by a membrane type seal. 4,044,941, Cl. 229-43.000.

Kobayashi, Fumio, to Sansui Electric Co., Inc. Loudspeaker device. 4,044,855, Cl. 181-151.000.

Kobe, Inc.: *See*—
Brown, Francis Barton; and Erickson, John W., 4,044,943, Cl. 233-19.00A.
Erickson, John W.; and Budrys, Vitolis, 4,045,145, Cl. 415-89.000.

Kobe Steel, Limited: *See*—
Iio, Katsuro; and Osato, Akiyoshi, 4,045,648, Cl. 219-137.00R.

Koch, Friedrich-Karl; and Schneiders, Hugo, to Peltzer & Ehlers. Device for controlling auxiliary means arranged in the reciprocating carriage of single or multistage presses. 4,044,619, Cl. 74-53.000.

Koch, Ulrich H.: *See*—
Matousek, Stephen; and Koch, Ulrich H., 4,044,631, Cl. 74-606.00R.

Kodaira, Heiichi. Valve means. 4,044,996, Cl. 251-229.000.

Koff, Arnold, to Hoffmann-La Roche Inc. Stable emulsions and improved temperature monitoring films prepared therefrom. 4,045,383, Cl. 260-8.000.

Kofman, Natalia Monovna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Koga, Tadao: *See*—
Igarashi, Jun; Koga, Tadao; and Ueda, Satoshi, 4,045,051, Cl. 280-644.000.

Kogure, Koji: *See*—
Urai, Muneharu; Kogure, Koji; and Haraguchi, Youichiro, 4,044,715, Cl. 118-50.000.

Kohlstette, Werner; and Pautsch, Gunthard, to Westfalia Separator AG. Self-cleaning centrifugal separator having a main piston valve defining one side of the separating chamber and connected to at least one auxiliary piston valve. 4,044,945, Cl. 233-20.00A.

Kohno, Yoshio: *See*—
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, 4,044,540, Cl. 57-153.000.

Koike, Mitsuo, to Kabushiki Kaisha Daini Seikosha. Digital liquid crystal electronic timepiece with color coded display. 4,044,546, Cl. 58-50.90R.

Koitabashi, Takeo; Akamatsu, Hideo; and Fujimori, Noboru, to Konishiroku Photo Industry Co., Ltd. Light-sensitive super-sensitized silver halide color photographic materials. 4,045,230, Cl. 96-100.00R.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Takahata, Fumio; Takahashi, Toshio; and Hirata, Yasuo, 4,045,614, Cl. 178-69.100.

Kolbly, Richard B.: *See*—
United States of America, National Aeronautics and Space Administration; and Kolbly, Richard B., 4,045,728, Cl. 324-59.000.

Kolkka, Toivo I. Rock heater for sauna. 4,044,755, Cl. 126-344.000.

Kolodziej, Alojzy Antoni, to Ronson Corporation. Method and apparatus for forming a helical cutter strip for a dry shaver assembly. 4,044,636, Cl. 76-104.00R.

Kolonia, Robert A. Splitting assembly. 4,044,808, Cl. 145-2.00R.

Komai, Hiromichi: *See*—
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, 4,045,802, Cl. 346-140.00R.

Komai, Hiromu: *See*—
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.

Komai, Takeshi: *See*—
Matsuyama, Kazuo; and Komai, Takeshi, 4,045,463, Cl. 260-453.0RZ.

Komarov, Jury Ivanovich: *See*—
Titov, Dmitry Vladimirovich; Komarov, Jury Ivanovich; Butuzov, Alexei Vasilievich; and Farzaliev, Mazakhir Gamza Ogly, 4,044,801, Cl. 139-436.000.

Komatu, Masao, to Koshi Arita. Highly electron-conductive composition. 4,045,375, Cl. 252-519.000.

Kondo, Mitsura; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, to Kanzaki Paper Manufacturing Co., Ltd. Process for preparing triarylmethane derivatives. 4,045,458, Cl. 260-393.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Koitabashi, Takeo; Akamatsu, Hideo; and Fujimori, Noboru, 4,045,230, Cl. 96-100.00R.

Konus-Kessel Gesellschaft fur Warmetechnik mbH & Co. KG: *See*—
Rychen, Niklaus; and Fuchshuber, Peter Werner, 4,044,727, Cl. 122-449.000.

Koo, Richard C. M. Electrically heated soldering device. 4,045,651, Cl. 219-227.000.

Koppel, Gary A., to Eli Lilly and Company. Preparation of cephalosporin ethers. 4,045,435, Cl. 544-28.000.
Koppers Company, Inc.: *See—*
Adams, Donald N., 4,044,630, Cl. 74-600.000.
Powell, Russell A., 4,044,612, Cl. 73-341.000.
Korenowski, Theodore Frank; Penland, Jerry Lee; and Ritzert, Chalmer John, to Dart Industries Inc. Waste treatment of fluoroborate solutions. 4,045,339, Cl. 210-45.000.
Korosec, Philip S.: *See—*
Lee, Donald A.; and Korosec, Philip S., 4,045,363, Cl. 252-49.500.
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna. Antifriction self-lubricating material. 4,045,400, Cl. 260-37.00N.
Korshunov, Evgeny Alexeevich. Mill for rolling continuously cast ingot. 4,044,584, Cl. 72-214.000.
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, to Toyo Soda Manufacturing Co., Ltd. High-energy radiation induced polymerization on a chromatographic solid support. 4,045,353, Cl. 210-502.000.
Kosgegi Leather & Vinyl Products, Inc.: *See—*
Artz, Kenneth W., 4,044,933, Cl. 224-26.00R.
Koshi Arita: *See—*
Komatu, Masao, 4,045,375, Cl. 252-519.000.
Koutsky, L. John: *See—*
Egert, Allen C.; Koutsky, L. John; and Ropp, Dale R., 4,045,082, Cl. 297-357.000.
Kouya, Shinichi: *See—*
Tokunou, Takashi; Kouya, Shinichi; and Akatsuka, Shigeki, 4,045,731, Cl. 324-78.00F.
Kowalski, Joseph W., to B-Line Systems, Inc. Conduit clamp. 4,044,428, Cl. 24-16.00R.
Kraftwerk Union Aktiengesellschaft: *See—*
Schabert, Hans-Peter; Porner, Horst; and Bauer, Artur, 4,044,898, Cl. 214-18.00N.
Krage, Mark K., to General Motors Corporation. Radar doppler frequency measuring apparatus. 4,045,797, Cl. 343-8.000.
Krahn, Wilhelm, to Optische Werke G. Rodenstock. Apparatus for the perimetric testing of the visual field of the human eye. 4,045,130, Cl. 351-24.000.
Krall, Hermann-Dieter; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for preparing azomethines. 4,045,486, Cl. 260-566.00R.
Kramming, Erik, to Bengt Lundin AB. Method of storing handle bags. 4,044,890, Cl. 206-493.000.
Krasnov, Alexandr Petrovich: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Kraus, Wayne P.: *See—*
Hutson, Thomas, Jr.; and Kraus, Wayne P., 4,045,503, Cl. 260-652.50P.
Krauss-Maffei Aktiengesellschaft: *See—*
Ratheiser, Heinz, 4,045,154, Cl. 425-467.000.
Krautkramer-Branson, Incorporated: *See—*
Owens, William T.; Davidson, Albin A.; and Nelson, Eldrid W., 4,044,594, Cl. 73-67.80S.
Kreiss, Joel S. Target in a bowl or urinal to attract the attention of urinating human males. 4,044,405, Cl. 4-1.000.
Krenzer, John: *See—*
Wu, Chin Ching; and Krenzer, John, 4,045,446, Cl. 260-294.80C.
Kreonite, Inc.: *See—*
Landers, Richard D., 4,045,809, Cl. 354-322.000.
Kresge, A. Norman: *See—*
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,507, Cl. 260-683.15B.
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,508, Cl. 260-683.15B.
Kressin, Wayne F.: *See—*
Peterson, Harold J.; and Kressin, Wayne F., 4,045,152, Cl. 425-419.000.
Krevenas, Paul; and Milne, David Graeme, to N L Industries, Inc. Rust resistant latex paint primer for metal surfaces. 4,045,393, Cl. 260-23.00R.
Kristenson, Kerstin Elisabeth; and Simonsson, Sven Bertil, to Aktiebolaget Electrolux. Combination dust container and latching means for a vacuum cleaner. 4,044,421, Cl. 15-339.000.
Krongauz, Evgenia Semenovna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Krueger, Kenneth Keith; and Pavlov, Todor, to Shiley Laboratories, Inc. Relief valve. 4,044,793, Cl. 137-612.100.
Krueger, Theodore H.; Eller, Robert; O'Brien, John; and Robbins, William L., to Krueger, Theodore H. Formation of metal parts. 4,044,816, Cl. 164-63.000.
Krug, Herbert A. Balanced bi-directional stretch knit fabric. 4,044,575, Cl. 66-192.000.
Kruger, Wilm: *See—*
Rumpp, Gerhard; Kruger, Wilm; and Scholz, Dieter, 4,044,845, Cl. 175-409.000.
Krutz, Ronald Louis: *See—*
Wolfe, Court Lone; and Krutz, Ronald Louis, 4,045,679, Cl. 250-461.00R.
Kuan, Tiong H.; and Sommer, John G., to General Tire & Rubber Company, The. Deflated tire lubricant. 4,045,362, Cl. 252-14.000.
Kuballa, Siegfried: *See—*
Vorbach, Guenther; and Kuballa, Siegfried, 4,044,453, Cl. 29-574.000.
Kubota, Yasuna, to Taimei Kinzoku Kabushiki Kaisha. Valve. 4,044,995, Cl. 251-188.000.
Kuchiba, Kensuke: *See—*
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, 4,045,374, Cl. 252-517.000.
Kugler, Florian: *See—*
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.
Kuhl, Peter J.: *See—*
Clarke, Robert Aifred; Kuhl, Peter J.; and Paschke, Richard H., 4,045,271, Cl. 156-366.000.
Kuhn, Eberhard: *See—*
Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, 4,045,223, Cl. 96-35.100.
Kuhne, Kurt Anton; and Wassilieff, Alexander, to Delta Plastics Limited. Printing machines. 4,044,665, Cl. 101-21.000.
Kulesza, Ralph J.: *See—*
Meyer, Burton C.; and Kulesza, Ralph J., 4,044,505, Cl. 51-5.00R.
Kunath, Helfrid, to U.S. Philips Corporation. Matrix printer head having a removable assembly. 4,044,878, Cl. 197-1.00R.
Kunde, Donald M.; and Lagrimanta, Frank M., to Prado Verde, Inc. Method for applying a liquid filler to lenses in glasses frames. 4,045,138, Cl. 351-178.000.
Kupcikevicius, Vytautas; and Mika, Anton LeRoy, to Union Carbide Corporation. Stuffing apparatus. 4,044,426, Cl. 17-49.000.
Kupf, Lubomir; and Mursec, Mirko, to Statni Vyzkumny Ustav Materialu. Filter assembly made of thermoplastic materials. 4,045,350, Cl. 210-232.000.
Kuramochi, Koujirou; and Ohnuma, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic torque converter with a lock-up clutch. 4,044,556, Cl. 60-361.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Katori, Kunihiko; Nagai, Hiroshi; and Shiiki, Zenya, 4,045,368, Cl. 252-421.000.
Kurono, Masayasu; Nakai, Hisao; and Muryobayashi, Takashi, to Ono Pharmaceutical Company. 16-Cyclobutyl-prostaglandins. 4,045,468, Cl. 260-468.00D.
Kurtz, Joel. Sailboat control apparatus. 4,044,703, Cl. 114-143.000.
Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz: *See—*
Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, 4,045,810, Cl. 357-24.000.
Kurz, Bruno F., deceased: *See—*
Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, 4,045,810, Cl. 357-24.000.
Kurz, Milton. Warp-knitted fabrics. 4,044,576, Cl. 66-193.000.
Kusatsu, Noriaki: *See—*
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, 4,044,540, Cl. 57-153.000.
Kusel Equipment Company: *See—*
Peterson, Harold J.; and Kressin, Wayne F., 4,045,152, Cl. 425-419.000.
Kuster, Jurgen; and Schlosser, Hermann, to Seitz-Werke GmbH. Method and apparatus for filtering. 4,045,342, Cl. 210-81.000.
Kusters, Norbert L.: *See—*
Cox, Louis G.; and Kusters, Norbert L., 4,045,734, Cl. 324-142.000.
Kusumoto, Yasuo, to Kabushiki Kaisha Daini Seikosha. Time adjusting system for an electronic timepiece. 4,044,547, Cl. 58-85.500.
Kusunose, Norio: *See—*
Mayumi, Hiroshi; Natsui, Yoshinobu; and Kusunose, Norio, 4,045,784, Cl. 340-173.0SP.
Kutzbach, Carl; Arens, Alfred; and Schmidt-Kastner, Gunter, to Bayer Aktiengesellschaft. Protease-free proteins, and methods of manufacturing and using the same. 4,045,552, Cl. 424-94.000.
Kwantes, Arien; Gautier, Pieter A.; and Farragher, Anthony L., to Shell Oil Company. Process for preparation of modified ion-exchange resin. 4,045,379, Cl. 260-2.20R.
Kzm "D. Blagoev": *See—*
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev,

Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna. 4,045,400, Cl. 260-37.00N.

Manifattura Magni Dante & C., S.p.A.: *See*—
Lova, Angelo, 4,044,461, Cl. 29-768.000.

Manska, Wayne E., to Moody, Ronald R. Device for intercepting and deflecting a moving body. 4,045,027, Cl. 273-96.00R.

Mansky, Michael Herman: *See*—
Howland, Robert Franklin; Mansky, Michael Herman; and Richards, Willie James. 4,045,586, Cl. 426-387.000.

Marans, Nelson Samuel; and Gluecksmann, Alfred, to W. R. Grace & Co. Flame retardant permanent press. 4,045,396, Cl. 260-29.2TN.

Marchello, John L.; and Trotter, Gerald F. Protective nose shield for race horses and the like. 4,044,531, Cl. 54-80.000.

Marchive, Daniel: *See*—
Guiraldenq, Pierre; Treheux, Daniel; and Marchive, Daniel. 4,045,596, Cl. 427-229.000.

Marcus, Erich: *See*—
Robson, John Howard; and Marcus, Erich. 4,045,416, Cl. 260-77.5CR.

Maremont Corporation: *See*—
Gray, Alden J., 4,045,718, Cl. 320-17.000.

Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Device for tilting sewing machine hooks to facilitate threading. 4,044,699, Cl. 112-200.000.

Margotte, Dieter: *See*—
Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo. 4,045,382, Cl. 260-4.00R.

Marincek, Frank M. Sewage disposal plant with evaporation/incineration means. 4,044,696, Cl. 110-9.00E.

Maringer, Albert, to Siemens Aktiengesellschaft. Circuit arrangement for evaluating the electrical output signals of a detector for thickness changes in a fuel injection line. 4,045,687, Cl. 307-358.000.

Marion Power Shovel Company, Inc.: *See*—
Baron, George B., 4,044,903, Cl. 214-138.00R.

Marker, Leon F.: *See*—
Dudek, Thomas J.; Marker, Leon F.; and Janssen, Hendrik Jan Jacob. 4,044,811, Cl. 152-354.000.

Markle, Robert Eugene, to Xerox Corporation. Self-correcting memory circuit. 4,045,779, Cl. 364-900.000.

Marotta Scientific Controls, Inc.: *See*—
Worden, Donald A.; de Versterre, William I.; and Petry, Henry Alfred. 4,044,580, Cl. 72-21.000.

Marquis, Edgar E.; and Knecht, William A., to Robertshaw Controls Company. Cut-back thermostat construction. 4,045,760, Cl. 337-301.000.

Marsch, Lawrence F.: *See*—
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,044,602, Cl. 73-59.000.
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,044,603, Cl. 73-59.000.

Marsh, Jeanette B. Educational methods and devices. 4,044,476, Cl. 35-35.00J.

Marshall, Richard C., to Xerox Corporation. Electrical cable and coupling arrangement. 4,045,750, Cl. 333-6.000.

Martin, Blair Robertson, to International Business Machines Corporation. High speed wheel printer and method of operation. 4,044,880, Cl. 197-18.000.

Martin, Edward J.; and Minkevitch, Joseph M. Axial compression powder dispenser. 4,044,836, Cl. 169-30.000.

Martin, Graham Ernest; Cockshott, Ian Derek; and Fildes, Francis James Thomas, to Imperial Chemical Industries Limited. Fibrillar lining for prosthetic device. 4,044,404, Cl. 3-19.000.

Martin, Jay Robert, to Union Carbide Corporation. Radioactive krypton gas separation. 4,045,191, Cl. 55-179.000.

Martin, Jeffrey Forsha: *See*—
Feldstein, Joel Gary; and Martin, Jeffrey Forsha. 4,044,798, Cl. 138-90.000.

Martin, Larry D.: *See*—
Banks, William P.; and Martin, Larry D., 4,045,253, Cl. 148-6.14R.

Martin, Roger: *See*—
Gugenberger, Rene; and Martin, Roger. 4,044,825, Cl. 165-165.000.

Martini, Joseph A.: *See*—
Morin, Wilfred F.; and Martini, Joseph A., 4,044,519, Cl. 52-304.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; Jaworski, Eugene; and Sakoda, Tom Kenzo. 4,045,024, Cl. 273-43.00A.
Meyer, Burton C.; and Kulesza, Ralph J., 4,044,505, Cl. 51-5.00R.
Montague, Douglas P.; Brand, Derek A.; and Morrison, Howard J., 4,044,660, Cl. 99-326.000.

Maryland Cup Corporation: *See*—
Ludder, Rodney E., 4,044,484, Cl. 40-306.000.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Method of making stretchable and compressible elongate member. 4,045,592, Cl. 427-45.000.

Masaaki, Noguchi; Yukiyasu, Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Auxiliary combustion chamber for an internal combustion engine. 4,044,730, Cl. 123-75.00B.

Masaki, Shinzaburo: *See*—
Yamada, Eiji; Fukasawa, Akira; and Masaki, Shinzaburo. 4,045,454, Cl. 260-369.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.): *See*—
Lindner, Horst. 4,044,731, Cl. 123-90.350.

Maschinenfabrik Goebel GmbH: *See*—
Jakob, Hans. 4,045,012, Cl. 270-79.000.

Maschinenfabrik Schweiter AG: *See*—
Luz, Rudolf. 4,044,961, Cl. 242-35.50R.

Masuda, Kenzo, to Hitachi, Ltd. Voltage comparator circuit. 4,045,686, Cl. 307-355.000.

Masuda, Shigeyuki: *See*—
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki. 4,044,543, Cl. 58-23.00R.

Masuyama, Toshio: *See*—
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi. 4,045,526, Cl. 264-.500.

Mathisrud, Jon A.: *See*—
Ocel, John J.; Ocel, Donald J.; and Mathisrud, Jon A., 4,044,770, Cl. 128-304.000.

Matilainen, Waltteri. Automatic zeroing of scales with digital display. 4,044,846, Cl. 177-165.000.

Matousek, Stephen; and Koch, Ulrich H., to Whitney Research Tool Company. Rotary actuator. 4,044,631, Cl. 74-606.00R.

Matsubara, Masaki, to Olympus Optical Co., Ltd. Enlarging lens system. 4,045,127, Cl. 350-210.000.

Matsugasako, Kenji: *See*—
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji. 4,044,540, Cl. 57-153.000.

Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Aisin Seiki Kabushiki Kaisha. Process for making a minute hole. 4,045,311, Cl. 204-129.550.

Matsui, Toshikazu: *See*—
Nakajima, Takanobu; Matsui, Toshikazu; and Aizawa, Tatsuo. 4,045,165, Cl. 432-60.000.

Matsumoto, Noboru: *See*—
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru. 4,044,739, Cl. 123-119.00A.

Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Fertilizer composition. 4,045,204, Cl. 71-11.000.

Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Resin composition of hydrophilic pullulan, hydrophobic thermoplastic resin, and plasticizer. 4,045,388, Cl. 260-17.4ST.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji. 4,045,791, Cl. 340-324.00M.
Kaname, Yuichi; Nakajima, Masaya; and Tabuchi, Katumi. 4,044,611, Cl. 73-170.00A.
Miyamoto, Mamoru; and Ishikawa, Kazuo. 4,045,763, Cl. 338-23.000.
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi. 4,045,374, Cl. 252-517.000.
Noma, Shinichi; and Ohshima, Nobumasa. 4,045,327, Cl. 204-299.00R.
Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki. 4,045,178, Cl. 23-254.00E.
Shimizu, Teruo. 4,044,545, Cl. 58-42.500.

Matsushita Electronics Corporation: *See*—
Nakatani, Hirokuni; Takamura, Toru; and Hashimoto, Susumu. 4,045,817, Cl. 358-213.000.

Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, to Nippon Kokan Kabushiki Kaisha. Method for controlling combustion in coke oven battery. 4,045,292, Cl. 201-1.000.

Matsuyama, Kazuo; and Komai, Takeshi, to Nippon Oil and Fats Co., Ltd. Peroxyesters of sorbic acid. 4,045,463, Cl. 260-453.0RZ.

Matthews, John C. Anti-ejection system for control rod drives. 4,044,622, Cl. 74-424.80R.

Matthews, Russell Byron, to Johnson Controls, Inc. Slow-opening gas valve. 4,044,794, Cl. 137-613.000.

Mattila, Tapio: *See*—
Renvall, Ilkka; and Mattila, Tapio. 4,045,453, Cl. 260-347.400.

Matveev, Georgy Vasilievich: *See*—
Kandakov, Gennady Petrovich; Matveev, Georgy Vasilievich; and Miller, Viktor Yakovlevich. 4,045,056, Cl. 285-41.000.

Matzner, Markus: *See*—
Young, Robert Hayward; and Matzner, Markus. 4,045,180, Cl. 23-260.000.

Maudal, Inge, to General Dynamics Corporation. Integrated thrust vector aerodynamic control surface. 4,044,970, Cl. 244-3.220.

Maune, Neil F., to Profile Systems, Inc. Frame concealed exteriorly opening operating sash. 4,044,503, Cl. 49-400.000.

Maurino, William J.; and Putzer, Raymond M., to Precision Flexmold, Inc. Molding apparatus including one-piece flexible mold and means to restrict the deformation of the mold. 4,045,153, Cl. 425-440.000.

Maxted, Wesley R., to Rapistan Incorporated. Conveyor sorting and orienting system. 4,044,897, Cl. 214-11.00R.

Maxwell, Clifford J., to Olin Corporation. Use of hydroquinone in polyurethane foams containing halogenated phosphate polyester additives. 4,045,378, Cl. 260-2.5AJ.

May & Baker Limited: *See*—
Caton, Michael Peter Lear; and Parker, Trevor. 4,045,467, Cl. 260-468.00D.

Maynard, Michael, to Gestetner Limited. Stencil duplicator. 4,044,670, Cl. 101-128.100.

Mayumi, Hiroshi; Natsui, Yoshinobu; and Kusunose, Norio, to Nippon Electric Co., Ltd. Programmable read only memory integrated circuit device. 4,045,784, Cl. 340-173.0SP.

Mazaeva, Irina Sergeevna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Mazzetti, Flavio J. Multi-stage sampler for flowing material. 4,044,617, Cl. 73-424.000.

McCarthy, Charles J.; Charles, Steven; and Eichenbaum, Daniel M., to United States of America, Health, Education and Welfare. Chin activated switch. 4,045,630, Cl. 200-52.00R.

McCluskey, John R.; and Edwards, Ralph R. Support devices for stanchions. 4,045,003, Cl. 256-59.000.

McCollum, Robert W.: *See*—
Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., 4,044,827, Cl. 166-133.000.

McCord Corporation: *See*—
Vogel, John D., 4,044,953, Cl. 239-229.000.

McDonald, Dean T.: *See*—
Williams, Michael R.; and McDonald, Dean T., 4,044,952, Cl. 239-165.000.

McDonald, Donald C.; Ela, Roger B.; and Whittaker, Francis E., to Walker Magnetics Group, Inc. Load tilting magnetic lift. 4,044,894, Cl. 214-1.0QD.

McDonnell Douglas Corporation: *See*—
Blechen, Frederick C.; and Roberts, Lloyd L., 4,044,975, Cl. 244-181.000.
Boy de la Tour, Roger, 4,045,681, Cl. 307-113.000.
Klein, Herman C., 4,044,708, Cl. 116-129.00P.
Ostroff, Harold H., 4,044,683, Cl. 102-90.000.
Rodrigue, Normand N., 4,044,790, Cl. 137-465.000.

McDowell-Wellman Engineering Co.: *See*—
Mercer, James R., 4,044,925, Cl. 222-263.000.

McGregor, Daniel P.: *See*—
McGregor, John C., Sr.; McGregor, Daniel P.; and McGregor, James B., 4,044,621, Cl. 74-243.00R.

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McGregor, John C., Sr.; McGregor, Daniel P.; and McGregor, James B., 4,044,621, Cl. 74-243.00R.

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McGuirk, Francis A., Jr.: *See*—
Atkins, Carl E.; and McGuirk, Francis A., Jr., 4,045,778, Cl. 340-171.0PF.

McKenzie, Roland W., to City Tank Corporation. Valve assembly. 4,044,791, Cl. 137-493.900.

McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., to Hayes International Corporation. Rear section of jet power plant installations. 4,044,555, Cl. 60-264.000.

McNally, Frank X., to CSE Corporation. Apparatus for detecting combustible gases. 4,045,177, Cl. 23-254.00E.

McNaughton, James L.: *See*—
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,044,939, Cl. 228-176.000.

McNellis, Terrence J.: *See*—
Fischer, Larry J.; and McNellis, Terrence J., 4,044,521, Cl. 52-404.000.

McNichols, Larry A., to Medtronic, Inc. Implantable receiver circuit. 4,044,775, Cl. 128-421.000.

McQueen, Raymond R., Jr.; and Buerki, Christian E., to Norris Industries Inc. Stay-hot control for microwave oven. 4,045,640, Cl. 219-10.55B.

McVeigh, James H., to Xerox Corporation. Method for electrostatically producing a color accented photocopy. 4,045,218, Cl. 96-1.200.

McWhorter, Daniel M.; and Patel, Bhupendra C., to Kendall Company, The. Cholangiography device and method. 4,044,757, Cl. 128-2.00A.

"Meci" Materiel Electrique de Controle et Industriel: *See*—
Renet, Claude, 4,045,300, Cl. 204-1.00T.

Medical Evaluation Devices and Instruments Corporation: *See*—
Kline, William Mathes, 4,044,765, Cl. 128-214.400.

Medtronic, Inc.: *See*—
Corbin, Terry; and Zytkovicz, Duane J., 4,044,774, Cl. 128-404.000.
McNichols, Larry A., 4,044,775, Cl. 128-421.000.

Meehan, David H.; and Tzakis, George J., to Zenith Radio Corporation. High voltage shutdown circuit responsive to excessive beam current and high voltage. 4,045,742, Cl. 328-9.000.

Meier, Gerald H.: *See*—
Worick, Richard A., 4,044,842, Cl. 172-314.000.

Meier, Werner: *See*—
Cassal, Jean-Marie; Furst, Andor; and Meier, Werner, 4,045,490, Cl. 260-590.0FA.

Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, to Hoechst Aktiengesellschaft. Water-soluble reactive naphthylazonaphthyl dyestuffs. 4,045,428, Cl. 260-198.000.

Meisel, Nicolas, to Food Processing Systems Corporation. Continuous microwave and vacuum dryer. 4,045,639, Cl. 219-10.55A.

Melin, Arthur Kelso: *See*—
Gillespie, Richard Lee; and Melin, Arthur Kelso, 4,045,026, Cl. 273-96.00R.

Melke, George A., to Jervis B. Webb Company. Driverless vehicle and guidance system. 4,044,853, Cl. 180-98.000.

Meng, Karl: *See*—
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,045,571, Cl. 424-273.00P.

Mengler, Helmut, to Hoechst Aktiengesellschaft. 3-[3',4'-Dichloro-6'-alkyl-phenyl]-Δ 2-pyrazoline derivatives and their use as optical brighteners. 4,045,169, Cl. 8-1.00W.

Menon, Sukumaran K.; and Hattler, Louis R., to Xerox Corporation. Heated fuser release agent container. 4,045,163, Cl. 432-59.000.

Mercer, David L., to International Nickel Company, Inc., The. Carbonylation process. 4,045,541, Cl. 423-417.000.

Mercer, James R., to McDowell-Wellman Engineering Co. Screw feeder for injection molding machine. 4,044,925, Cl. 222-263.000.

Merchill, Geoffrey Leonard, to Hindes Limited. Grooming and dispensing brush head. 4,044,724, Cl. 119-83.000.

Merck & Co., Inc.: *See*—
Smith, Robert L.; and Lee, Ta-Jyh, 4,045,558, Cl. 424-232.000.

Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, to BASF Aktiengesellschaft. Manufacture of anthraquinones. 4,045,456, Cl. 260-369.000.

Mesek, Frederick K.; and Repke, Virginia L., to Johnson & Johnson. Diaper with split puff bonded facing. 4,044,768, Cl. 128-287.000.

Meserole, Robert Henry, to Johns-Manville Corporation. Thin-walled metal duct having integral reinforced ends for joining and method and apparatus for its manufacture. 4,044,581, Cl. 72-68.000.

Messrs. BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag: *See*—
Rahmstorf, Dietmar, 4,044,498, Cl. 46-116.000.

Metal Box Limited: *See*—
Beveridge, John, 4,044,916, Cl. 220-270.000.

Metallurgie Hoboken-Overpelt: *See*—
Wens, Karel; Tobback, Hubert; and Hens, Karel, 4,045,301, Cl. 204-12.000.

Meyer, Burton C.; and Kulesza, Ralph J., to Marvin Glass & Associates. Etching device for glass or other etchable surfaces. 4,044,505, Cl. 51-5.00R.

Meyer, Elizabeth Jane, executrix: *See*—
Meyer, Harry W., deceased; Baker, Jerry D.; and Ceckler, William H., 4,045,216, Cl. 75-84.000.

Meyer, Harry W., deceased (by Meyer, Elizabeth Jane, executrix); Baker, Jerry D.; and Ceckler, William H., to Amax Inc. Direct reduction of molybdenum oxide to substantially metallic molybdenum. 4,045,216, Cl. 75-84.000.

Meyer, Raymond J.: *See*—
Remaley, Edward G.; Baker, Robert W.; and Meyer, Raymond J., 4,045,599, Cl. 427-333.000.

Micheletti, Arrigo, to Billi, S.p.A. Method of closing the toe opening of a knit stocking or the like. 4,044,574, Cl. 66-187.000.

Michels, Norman C., to Lee Wilson Engineering Company, Inc. Flat-flame gas burner. 4,045,160, Cl. 431-348.000.

Michelson, Gunnar P., to NCR Corporation. Document deskewing apparatus. 4,045,018, Cl. 271-251.000.

Micro Consultants, Limited: *See*—
Walker, Ian Clive, 4,045,613, Cl. 178-69.100.

Middleton, Foster Hugh: *See*—
Le Blanc, Lester Robert; and Middleton, Foster Hugh, 4,044,606, Cl. 73-67.700.

Midland-Ross Corporation: *See*—
Amsler, David C.; and Wagner, William E., 4,044,909, Cl. 220-3.800.
Dann, Daryl L., 4,045,631, Cl. 200-61.430.
Dauberger, George R., 4,044,908, Cl. 220-3.800.

Mierzwinski, Eugene P.; and Worley, David W., to Magnavox Company, The. Remote control transmitter and receiver for use with a television receiver. 4,045,777, Cl. 340-168.00B.

Miesen, Ernest: *See*—
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.

Mihailovski, Alexander; and Chan, Jimmy H., to Stauffer Chemical Company. Process for preparing N-carbamoyl ethyl oxanilates. 4,045,471, Cl. 260-471.00A.

Mihara, Kazuo: *See*—
Ishii, Masaichi; and Mihara, Kazuo, 4,044,418, Cl. 15-104.06A.

Mika, Anton LeRoy: *See*—
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Mikhailov, Viktor Vasilievich; Litver, Semen Lvovich; and Karasev, Alexandr Konstantinovich. Method of manufacturing prestressed reinforced concrete articles. 4,045,533, Cl. 264-228.000.

Mikosz, Daniel S.: *See*—
Ludwig, William F.; and Mikosz, Daniel S., 4,045,264, Cl. 156-63.000.

Milenov, Assen Parvanov: *See*—
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.

Milford-Astor Limited: *See*—
Hudson, William Ronald, 4,044,676, Cl. 101-297.000.

Miller, Barry, to Bell Telephone Laboratories, Incorporated. Rotating asymmetric electrode for measuring characteristics of electrochemical cells. 4,045,725, Cl. 324-30.00B.

Miller, Charles G.: *See—*
United States of America, National Aeronautics and Space Administration; and Miller, Charles G., 4,044,821, Cl. 165-2.000.
Miller, Errol S. Multi-purpose load winch. 4,045,002, Cl. 254-164.000.
Miller, Gerald R. Saucer boat. 4,044,704, Cl. 115-12.00R.
Miller, Howard I. Pet collar. 4,044,725, Cl. 119-106.000.
Miller, Jeanette Mary; and Miller, Robert Eric, to Miller, Victoria Alice; and Miller, Timothy Robert, part interest to each. Supports for cameras. 4,044,982, Cl. 248-183.000.
Miller, John J.: *See—*
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Miller, John W. V., to Owens-Illinois, Inc. Matrix discharge logic display system. 4,045,790, Cl. 340-324.00M.
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Miller, Jeanette Mary; and Miller, Robert Eric, 4,044,982, Cl. 248-183.000.
Miller, Timothy Robert: *See—*
Miller, Jeanette Mary; and Miller, Robert Eric, 4,044,982, Cl. 248-183.000.
Miller, Victoria Alice: *See—*
Miller, Jeanette Mary; and Miller, Robert Eric, 4,044,982, Cl. 248-183.000.
Miller, Viktor Yakovlevich: *See—*
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Miller, William Albert: *See—*
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Henson, Jimmy B., 4,045,598, Cl. 427-296.000.
Riddle, Dennis L., 4,044,716, Cl. 118-50.000.
Mills, Maurice T.: *See—*
Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., 4,044,806, Cl. 144-309.0AC.
Mills, Robert Samuel: *See—*
Cruthis, Robert Duane; and Mills, Robert Samuel, 4,044,692, Cl. 105-368.00R.
Milne, David Graeme: *See—*
Krevenas, Paul; and Milne, David Graeme, 4,045,393, Cl. 260-23.00R.
Milzner, Karlheinz: *See—*
Muhle, Herbert; Milzner, Karlheinz; and Reisser, Fritz, 4,045,561, Cl. 424-251.000.
Minkevitch, Joseph M.: *See—*
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Minkowski, Jan M.: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Fong, Jaan-Jiue; and Hsu, Grace F., 4,045,305, Cl. 204-50.00R.
Minolta Camera Kabushiki Kaisha: *See—*
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, 4,045,135, Cl. 355-11.000.
Saito, Mitsuru, 4,045,805, Cl. 354-25.000.
Missale, John V. Scanning receiver for use in a tour guide system. 4,045,741, Cl. 325-470.000.
Mita Industrial Co., Ltd.: *See—*
Nakajima, Takanobu; Matsui, Toshikazu; and Aizawa, Tatsuo, 4,045,165, Cl. 432-60.000.
Mitchard, John M., to Union Camp Corporation. Apparatus for folding panels of carton blank. 4,044,658, Cl. 93-49.00R.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Nishi, Atsuyoshi; and Yashiro, Katuo, 4,045,159, Cl. 431-328.000.
Mitsubishi Heavy Industries, Ltd.: *See—*
Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, 4,045,338, Cl. 210-36.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mitsubishi Precision Company, Ltd.: *See—*
Fujisawa, Kenzo; Sakaedani, Yoshiyasu; and Tsuji, Akio, 4,044,475, Cl. 35-6.000.
Mitsubishi Rayon Co., Ltd.: *See—*
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Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, 4,045,338, Cl. 210-36.000.
Mitsumori, Nobuo; Takeda, Chikahiro; and Miyasako, Hideichi, to Nippon Shinyaku Company, Limited. Method of treating silver impregnated activated carbon. 4,045,553, Cl. 424-132.000.
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas control valve. 4,044,739, Cl. 123-119.00A.
Miyake, Makoto: *See—*
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Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, 4,045,338, Cl. 210-36.000.
Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, to Mitsubishi Rayon Co., Ltd.; and Mitsubishi Heavy Industries, Ltd. Method of removing scale-forming substances from hot water system. 4,045,338, Cl. 210-36.000.
Miyamoto, Mamoru; and Ishikawa, Kazuo, to Matsushita Electric Industrial Co., Ltd. Sealed thermostatic heater. 4,045,763, Cl. 338-23.000.
Miyao, Saisei: *See—*
Nagano, Tadashi; Miyao, Saisei; and Takeda, Katsuhiko, 4,045,279, Cl. 162-25.000.
Miyasaki, Kenneth: *See—*
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Mlavsky, Abraham I.; and Winston, Roland, to Mobil Tyco Solar Energy Corporation. Solar cells with concentrators. 4,045,246, Cl. 136-89.0PC.
Moba Holding Barneveld B.V.: *See—*
Mosterd, Jacob Hendrik, 4,045,073, Cl. 294-87.00A.
Mobil Oil Corporation: *See—*
Ireland, Henry R.; Peters, Alan W.; and Stein, Thomas R., 4,045,505, Cl. 260-673.000.
Olson, Robert H., 4,044,919, Cl. 221-63.000.
Mobil Tyco Solar Energy Corporation: *See—*
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Moebus, Bernhard; Larch, Gerhard; and Friedrich, Rudolf, to Fa. Moebus KG. Centrifuge. 4,044,944, Cl. 233-20.00A.
Moeller, Guido. Internal combustion engine. 4,044,728, Cl. 123-18.00A.
Moeller & Neumann GmbH: *See—*
Buchheit, Otto K., 4,044,585, Cl. 72-201.000.
Moench, Jerry Dale, to Motorola, Inc. Digital to analog converter. 4,045,793, Cl. 340-347.0DA.
Moertel, George B., to Textron Inc. Slide fastener and method and apparatus of manufacture. 4,044,431, Cl. 24-205.13C.
Moisar, Erik: *See—*
Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, 4,045,228, Cl. 96-64.000.
Mold, Donald F.; and Rice, Ronald G., to Owens-Illinois, Inc. Method of making a recuperator structure by crystallization. 4,045,199, Cl. 65-33.000.
Molins Limited: *See—*
Preston, Edward George; and Rakowicz, Jan Antoni, 4,044,779, Cl. 131-21.00R.
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, to Polysius AG. Rotary kiln having a planetary row of cooler tubes. 4,045,161, Cl. 432-80.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazol-5-ones. 4,045,571, Cl. 424-273.00P.
Molon Motor & Coil Corporation: *See—*
Folik, Joseph C., 4,045,697, Cl. 310-89.000.
Momiyama, Kikuo, to Canon Kabushiki Kaisha. Telephoto objective. 4,045,128, Cl. 350-216.000.
Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,044,677, Cl. 101-348.000.
Mongeau, Roland E., to Tower Manufacturing Corporation. Electrical switch assembly having two-part housing with cover part consisting of plural flanges, internal rotation limit stop and external bushing. 4,045,637, Cl. 200-303.000.
Monks, Harry, to Coal Industry (Patents) Limited. Longwall mining machine with haulage motor sensed pressure controlled rail brake. 4,045,083, Cl. 299-1.000.
Monogram Industries, Inc.: *See—*
Rod, Robert L.; Penick, Walter L., Jr.; and Heller, Henry B., 4,045,314, Cl. 204-151.000.
Monotype Corporation Limited, The: *See—*
Baylis, Howard Raymond; and Edwards, Roger Alan, 4,045,803, Cl. 354-5.000.
Monsanto Company: *See—*
Burd, John W.; Stone, Bobbie D.; Tucker, William F.; and Gupta, Kedar P., 4,045,181, Cl. 23-273.00R.
Convent, Bernard, 4,045,206, Cl. 71-90.000.
Convent, Bernard, 4,045,207, Cl. 71-92.000.
Convent, Bernard, 4,045,210, Cl. 71-120.000.
Dahms, Ronald H., 4,045,398, Cl. 260-29.300.
Weeks, Lloyd E.; Johnson, John H.; and Reents, Margaret J., 4,045,297, Cl. 195-103.50R.
Wyman, Charles E.; and Holstead, Robert D., 4,045,354, Cl. 210-523.000.
Montague, Douglas P.; Brand, Derek A.; and Morrison, Howard J., to Marvin Glass & Associates. Automatic toaster. 4,044,660, Cl. 99-326.000.
Moody, Ronald R.: *See—*
Manska, Wayne E., 4,045,027, Cl. 273-96.00R.
Moody Si Ltd.: *See—*
Guerette, Marcel, 4,044,857, Cl. 182-17.000.
Moore, Kenneth C. Corn kernel cutter. 4,044,776, Cl. 130-9.00D.
Moore, Robert J.; and Curtis, Gerald B. Control of roofing procedure. 4,045,263, Cl. 156-64.000.
Moorehead, James R., to Boeing Company, The. Nacelle assembly and mounting structures for a turbofan jet propulsion engine. 4,044,973, Cl. 244-54.000.
Morais, Don, to General Electric Company. Discharge lamp operating circuit. 4,045,709, Cl. 315-205.000.

Moran, Henry W.: *See*—
Welstead, William J., Jr.; and Moran, Henry W., 4,045,576, Cl. 424-309.000.

Morawetz, Ernst; and Glas, Lars-Olof. Heat storage system. 4,044,949, Cl. 237-1.00A.

Morgan, Charles R., to W. R. Grace & Co. Solid curable polyene compositions containing a polythiol. 4,045,516, Cl. 260-886.000.

Mori, Takaro: *See*—
Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, 4,045,621, Cl. 179-100.4ST.

Mori, Yasamasu; Ashiuchi, Kenzo; Yasytome, Osamu; and Sawamura, Tagayasu, to Tokyo Shibaura Electric Co., Ltd. Flat envelope type fluorescent character indicating tube with getter shield plate. 4,045,703, Cl. 313-497.000.

Morikawa, Atsuko: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.

Morimatsui, Hideharu: *See*—
Iida, Masajiro; Morimatsui, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,045,766, Cl. 340-1.00R.

Morin, Bernard. Turbine. 4,045,148, Cl. 416-84.000.

Morin, Wilfred F.; and Martini, Joseph A. Insulated double glass window assembly. 4,044,519, Cl. 52-304.000.

Moriyama, Shigeo; and Kawamura, Yoshio, to Hitachi, Ltd. Photoelectric microscope. 4,045,141, Cl. 356-156.000.

Morizane, Fukuichi: *See*—
Iwahashi, Shunji; Morizane, Fukuichi; and Kato, Yasuyuki, 4,045,514, Cl. 260-873.000.

Morlet, Jean Georges: *See*—
Leroy, Pierre; Morlet, Jean Georges; and Saleil, Jean, 4,045,215, Cl. 75-82.000.

Morokawa, Shigeru; and Sekiya, Fukuo. Solid state binary logic signal source for electronic timepiece or the like. 4,045,692, Cl. 307-279.000.

Morrill, Wayne J. Small air gap motor. 4,045,698, Cl. 310-166.000.

Morris, James F., to United States of America, National Aeronautics and Space Administration. Thermocouples of tantalum and rhenium alloys for more stable vacuum-high temperature performance. 4,045,247, Cl. 136-240.000.

Morrison, Guy E., to Skei Corporation. Modem sharer. 4,045,774, Cl. 340-147.0LP.

Morrison, Howard J.: *See*—
Montague, Douglas P.; Brand, Derek A.; and Morrison, Howard J., 4,044,660, Cl. 99-326.000.

Morrison, William Craig, to Glacier Metal Company Limited, The. Bearings. 4,044,441, Cl. 29-149.50R.

Mort, Charles F.: *See*—
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,044,939, Cl. 228-176.000.

Morton, William G. Safety helmet with individualized head-contoured inter-liner. 4,044,399, Cl. 2-414.000.

Mosch, Alfred. Warning device. 4,044,482, Cl. 40-129.00C.

Moser, Rabin, to Xerox Corporation. Use of silicone oil as a polyethylene oxidation retardant in a toner image fusing apparatus. 4,045,164, Cl. 432-60.000.

Moss, Paul B.; and Watson, Gilbert L., to Moss, Paul B. Holder for carbon arc electrodes. 4,045,649, Cl. 219-143.000.

Mosterd, Jacob Hendrik, to Moba Holding Barneveld B.V. Device for displacing an egg-tray. 4,045,073, Cl. 294-87.00A.

Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Gros, Hermann, 4,044,869, Cl. 192-48.910.

Motorola, Inc.: *See*—
Coleman, Michael G.; and Pryor, Robert A., 4,045,245, Cl. 136-89.00C.
Kline, Arthur Jonathan, Jr., 4,045,796, Cl. 343-6.50R.
Moench, Jerry Dale, 4,045,793, Cl. 340-347.0DA.

Mott, James D., to Hydril Company. Subsurface well apparatus having improved operator means and method for using same. 4,044,835, Cl. 166-322.000.

Moutou, Paul Cyril, to Thomson-CSF. Method of manufacturing a semiconductor structure for microwave operation, including a very thin insulating or weakly doped layer. 4,045,252, Cl. 148-1.500.

Mueller, Armand G., to Square D Company. Segmented expansion absorber for lifting magnet. 4,045,756, Cl. 335-292.000.

Mueller, Richard A., to G. D. Searle & Co. 1-(Substituted amino)alkanoyl-2-(dibenzoxazepine-10-carbonyl)hydrazines and derivatives thereof. 4,045,442, Cl. 260-293.580.

Muhle, Herbert; Milzner, Karlheinz; and Reisser, Fritz, to Sandoz Ltd. Pesticidal pyrimidinyl phosphorus esters. 4,045,561, Cl. 424-251.000.

Muhlich, Albert: *See*—
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,045,198, Cl. 65-33.000.

Muller, Jean-Claude: *See*—
Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, 4,045,213, Cl. 75-48.000.

Multi-Elmac Company: *See*—
Umpleby, Kenneth F.; and Brackney, Maurice R., 4,045,715, Cl. 318-16.000.

Munk, Miner N.: *See*—
Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 4,045,343, Cl. 210-101.000.

Muntz, Eric P.: *See*—
Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., 4,044,718, Cl. 118-647.000.

Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co. Ltd. 4-(3-Isopropylamino-2-hydroxypropoxy indene. 4,045,482, Cl. 260-570.700.

Murakawa, Kyohei: *See*—
Yamada, Seiichi; and Murakawa, Kyohei, 4,045,412, Cl. 264-63.000.

Muramatsu, Yukihiko: *See*—
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, 4,044,739, Cl. 123-119.00A.

Muraoka, Teruo: *See*—
Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, 4,045,621, Cl. 179-100.4ST.

Murari, Bruno: *See*—
Cini, Carlo; Murari, Bruno; and Santi, Mario, 4,045,745, Cl. 330-15.000.

Murase, Kiyoshi: *See*—
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.

Murata, Atsunobu: *See*—
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.

Murrmann, Helmuth: *See*—
Graul, Juergen; and Murrmann, Helmuth, 4,045,251, Cl. 148-1.500.

Mursec, Mirko: *See*—
Kupf, Lubomir; and Mursec, Mirko, 4,045,350, Cl. 210-232.000.

Muryobayashi, Takashi: *See*—
Kurono, Masayasu; Nakai, Hisao; and Muryobayashi, Takashi, 4,045,468, Cl. 260-468.00D.

Mussulman, Charles E. Piano. 4,044,644, Cl. 84-207.000.

N L Industries, Inc.: *See*—
Krevenas, Paul; and Milne, David Graeme, 4,045,393, Cl. 260-23.00R.
Thomas, Everett A.; and Knake, Ronald W., 4,045,233, Cl. 106-57.000.

N. V. Weefautomaten Picanol: *See*—
Steverlynck, Patrick A., 4,044,802, Cl. 139-449.000.

Nadkarni, Anil V.: *See*—
Shafer, William M.; and Nadkarni, Anil V., 4,045,644, Cl. 219-119.000.

Nafziger, Joel L. Animal waste treatment system. 4,045,522, Cl. 261-93.000.

Nagahara, Yasumori: *See*—
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, 4,045,134, Cl. 355-3.00R.

Nagai, Hiroshi: *See*—
Katori, Kunihiko; Nagai, Hiroshi; and Shiiki, Zenya, 4,045,368, Cl. 252-421.000.

Nagakita, Shigeo: *See*—
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.

Nagarai, Tadashi; Miyao, Saisei; and Takeda, Katsuhiko to Toyo Pulp Co., Ltd. Process for the manufacture of pulp using sodium carbonate and oxygen. 4,045,279, Cl. 162-25.000.

Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Zinc oxide voltage-nonlinear resistor. 4,045,374, Cl. 252-517.000.

Nagata, Seiichi: *See*—
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, 4,045,791, Cl. 340-324.00M.

Nakada, Katsuo, to Yoshida Kogyo Kabushiki Kaisha. Sash window with weathertight sealing means. 4,044,504, Cl. 49-425.000.

Nakai, Hisao: *See*—
Kurono, Masayasu; Nakai, Hisao; and Muryobayashi, Takashi, 4,045,468, Cl. 260-468.00D.

Nakajima, Masaya: *See*—
Kaname, Yuichi; Nakajima, Masaya; and Tabuchi, Katumi, 4,044,611, Cl. 73-170.00A.

Nakajima, Takanobu; Matsui, Toshikazu; and Aizawa, Tatsuo, to Mita Industrial Co., Ltd. Contact heat fixing device. 4,045,165, Cl. 432-60.000.

Nakajima, Yosiharu, to Okuma Machinery Works Ltd. Cam mechanism for circular knitting machine. 4,044,573, Cl. 66-57.000.

Nakamoto, Soichi: *See*—
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, 4,045,807, Cl. 354-38.000.

Nakamura, Koichi: *See*—
Shimamura, Isao; and Nakamura, Koichi, 4,045,225, Cl. 96-60.00R.

Nakane, Hisashi: *See*—
Toda, Hiroyuki; Otomegawa, Eiichi; Aoyama, Toshimi; and Nakane, Hisashi, 4,045,231, Cl. 96-115.00P.

Nakano, Seizo; Oishi, Kazuaki; Kikuchi, Takehiro; and Suda, Syoetu, to Hitachi, Ltd. Gas insulated switch-gear apparatus. 4,045,634, Cl. 200-148.00B.

Nakao, Hideyuki: *See*—
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.

Nakatani, Hirokuni; Takamura, Toru; and Hashimoto, Susumu, to Matsushita Electronics Corporation. Semiconductor optical image sensing device. 4,045,817, Cl. 358-213.000.

Nakatani, Seiichi: *See*—
Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, 4,045,178, Cl. 23-254.00E.

Nakayama, Wataru: *See*—
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.

Nalco Chemical Company: *See*—
Dolan, Jerome J.; and Rosenberger, Roy R., 4,045,733, Cl. 324-140.00R.

Namioka, Hisao: *See*—
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.

Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, to Abbott Laboratories. Antibiotic XK-62-2 and process for production thereof. 4,045,298, Cl. 195-80.00R.

Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, to Abbott Laboratories. Antibiotics designated XK-88 series. 4,045,610, Cl. 536-17.000.

Narita, Hitoshi: *See*—
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.

Naryshkin, Jury Anatolievich: *See*—
Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich, 4,045,006, Cl. 266-149.000.

National Machinery Co., The: *See*—
Haines, Allan D., 4,044,588, Cl. 72-337.000.

National Presto Industries, Inc.: *See*—
Soper, LaVern G.; and Dressel, Brent W., 4,045,653, Cl. 219-438.000.

National Research Development Corporation: *See*—
Edwards, Nigel, 4,044,402, Cl. 3-1.300.

National Semiconductor Corporation: *See*—
Bernardi, Carl E., 4,045,321, Cl. 204-202.000.
Tietz, Gary W., 4,045,689, Cl. 307-254.000.

Natsui, Yoshinobu: *See*—
Mayumi, Hiroshi; Natsui, Yoshinobu; and Kusunose, Norio, 4,045,784, Cl. 340-173.0SP.

Nausedas, Joseph Anthony, to Union Carbide Corporation. Product stuffing apparatus and method. 4,044,425, Cl. 17-35.000.

Nazarenko, Nicholas; and Seidel, William Carl, to Du Pont de Nemours, E. I., and Company. Process for the preparation of triarylboranes. 4,045,495, Cl. 260-606.50B.

NCR Corporation: *See*—
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,044,939, Cl. 228-176.000.
Michelson, Gunnar P., 4,045,018, Cl. 271-251.000.

Neal, Wayne R., to General Electric Company. Discharge lamp ballast circuit. 4,045,708, Cl. 315-171.000.

Neal, Wayne R., to General Electric Company. Discharge lamp operating circuit. 4,045,710, Cl. 315-205.000.

Nebzydoski, John W.: *See*—
Rubin, Isaac D.; and Nebzydoski, John W., 4,045,376, Cl. 252-56.00S.

Neetz, Michael A.: *See*—
Wieder, Rodney L.; Neetz, Michael A.; and Sell, Earl O., 4,045,067, Cl. 294-15.000.

Negishi, Eizaburo; and Negishi, Masanori, to Kabushiki Kaisha Negishi Kobyo Kenkyusho. Spinning method and apparatus therefor. 4,044,537, Cl. 57-58.890.

Negishi, Masanori: *See*—
Negishi, Eizaburo; and Negishi, Masanori, 4,044,537, Cl. 57-58.890.

Negoro, Sentaro: *See*—
Nishimura, Akira; Akamatsu, Hiroshi; Negoro, Sentaro; and Yoshida, Yasutoshi, 4,044,495, Cl. 43-121.000.

Neill, William M.: *See*—
Burt, George A., Jr.; and Neill, William M., 4,044,641, Cl. 83-341.000.

Nekola, Todd B.: *See*—
Strickland, James K.; Capps, Frank R.; Nekola, Todd B.; and Fremer, William A., 4,044,986, Cl. 249-216.000.

Nelson, Eldrid W.: *See*—
Owens, William T.; Davidson, Albin A.; and Nelson, Eldrid W., 4,044,594, Cl. 73-67.80S.

Nelson, James Irwin. Ball pick-up, storage, and individual delivery device. 4,045,068, Cl. 294-19.00A.

Nelson, Robert E.; and Pieper, Keith A., to General Motors Corporation. Stagnation sensing control. 4,044,551, Cl. 60-39.140.

Nestler, Gerhard: *See*—
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.

Nestor, Charles R., to General Motors Corporation. Jumper touch sensor current switching device. 4,045,650, Cl. 200-153.00K.

Neu, William F.: *See*—
Lee, Fred S.; and Neu, William F., 4,045,786, Cl. 340-174.0TF.

New England Business Service, Inc.: *See*—
Rowbottam, Francis W., 4,044,548, Cl. 58-125.00C.

New Life Foundation: *See*—
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,044,695, Cl. 110-8.00P.

New Process Industries, Inc.: *See*—
Benson, Glendon M., 4,044,558, Cl. 60-520.000.

NHK Spring Co., Ltd.: *See*—
Ueno, Kiyoshi, 4,045,081, Cl. 297-317.000.

Nichols, Dwight E., to Hoover Ball and Bearing Company. Lined container for storing and transporting thick viscous substances such as grease having anti-clogging liner support. 4,044,912, Cl. 220-63.00R.

Nichols, Willard A.: *See*—
Bhutani, Sudhir K.; and Nichols, Willard A., 4,045,502, Cl. 260-651.00F.

Nickol, Stephen L., to Suntech, Inc. Minimum energy process for preparing block copolymers of polyamides. 4,045,511, Cl. 260-857.0TW.

Nickol, Stephen L.: *See*—
Thompson, Robert M.; and Nickol, Stephen L., 4,045,512, Cl. 260-857.0TW.

Nicks, Robert W.: *See*—
Grant, Geoffrey F.; and Nicks, Robert W., 4,045,022, Cl. 273-29.00R.

Niemann, Helmut: *See*—
Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, 4,044,659, Cl. 93-77.0FT.

Nienburg, Hans Juergen: *See*—
Kniese, Wilhelm; and Nienburg, Hans Juergen, 4,045,492, Cl. 260-604.0HF.

Nihon Denshi Kabushiki Kaisha: *See*—
Watanabe, Eiji, 4,045,672, Cl. 250-360.000.

Niigata, Kunihiro: *See*—
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.

Nilsson, Bo Nils: *See*—
Oldaeus, Karl Olof; Tordenmalm, Osten Lars; and Nilsson, Bo Nils, 4,044,610, Cl. 73-133.00R.

Nippon Carbon Co., Ltd.: *See*—
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, 4,045,526, Cl. 264-.500.

Nippon Concrete Industries Co., Ltd.: *See*—
Gokyu, Isao, 4,044,640, Cl. 83-42.000.

Nippon Electric Co., Ltd.: *See*—
Mayumi, Hiroshi; Natsui, Yoshinobu; and Kusunose, Norio, 4,045,784, Cl. 340-173.0SP.

Nippon Kogaku, K.K.: *See*—
Iida, Yozo, 4,045,132, Cl. 352-91.00C.
Watanabe, Sakuji, 4,045,142, Cl. 356-223.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, 4,045,292, Cl. 201-1.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Matsuyama, Kazuo; and Komai, Takeshi, 4,045,463, Cl. 260-453.0RZ.

Nippon Seisen, Co., Ltd.: *See*—
Hamada, Koichi; Kikubu, Kaoru; and Itoh, Tsunehiro, 4,044,447, Cl. 29-419.00R.

Nippon Shinyaku Company, Limited: *See*—
Mitsumori, Nobuo; Takeda, Chikahiro; and Miyasako, Hideichi, 4,045,553, Cl. 424-132.000.

Nippondenso Co., Ltd.: *See*—
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, 4,044,739, Cl. 123-119.00A.

Nirschl, Joseph P.: *See*—
Watt, David M., Jr.; and Nirschl, Joseph P., 4,045,361, Cl. 252-8.800.

Nishi, Atsuyoshi; and Yashiro, Katuo, to Mitsubishi Denki Kabushiki Kaisha. Combustion apparatus. 4,045,159, Cl. 431-328.000.

Nishi, Kunio: *See*—
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, 4,045,374, Cl. 252-517.000.

Nishida, Isamu: *See*—
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.

Nishihara, Motohisa; and Ito, Tetsuo, to Hitachi, Ltd. Method of ultrasonic data communication and apparatus for carrying out the method. 4,045,767, Cl. 340-5.00R.

Nishimura, Akira; Akamatsu, Hiroshi; Negoro, Sentaro; and Yoshida, Yasutoshi, to Earth Chemical Company, Limited. Device for capturing cockroaches. 4,044,495, Cl. 43-121.000.

Nishimura, Satomu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas control valve. 4,044,737, Cl. 123-119.00A.

Nissan Denshi Kabushikigaisha: *See*—
Kawasaki, Kazuo, 4,045,739, Cl. 325-15.000.

Nissan Motor Company, Limited: *See*—
Okada, Yasumasa, 4,045,064, Cl. 292-125.000.

Nissei Plastics Industrial Co., Ltd.: *See*—
Aoki, Katashi, 4,044,653, Cl. 91-392.000.

Nissen Corporation: *See*—
Nissen, George P., 4,045,021, Cl. 272-65.000.

Nissen, George P., to Nissen Corporation. Trampoline apparatus for use in connection with tumbling and the like. 4,045,021, Cl. 272-65.000.

Nittetu Chemical Engineering Ltd.: *See*—
Tsuruta, Hidemasa; Kinoshita, Yoshiaki; and Tanaka, Isao, 4,045,341, Cl. 210-45.000.

Nobles, Elon J., to Econo-Therm Energy Systems Corporation. Method and apparatus for preheating combustion air while cooling a hot process gas. 4,044,820, Cl. 165-2.000.

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Andersen, Jens Arvid, 4,045,309, Cl. 204-67.000.
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Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich, 4,045,006, Cl. 266-149.000.
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Obenshain, David Noel, to Westvaco Corporation. Hollow core chucking device. 4,045,038, Cl. 279-2.00R.
Obersby, Derek; and Allen, Thomas Kenneth, to James A. Jobling & Company Limited. Glass tube cutting. 4,044,936, Cl. 225-2.000.
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Krueger, Theodore H.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,044,816, Cl. 164-63.000.
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Garrett, Donald E., 4,045,085, Cl. 299-2.000.
Ocel, Donald J.: *See*—
Ocel, John J.; Ocel, Donald J.; and Mathisrud, Jon A., 4,044,770, Cl. 128-304.000.
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Kjaergaard, Knud, 4,044,792, Cl. 137-505.220.
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Asinger, Friedrich; Offermanns, Heribert; and Gulzek, Karl-Heinz, 4,045,479, Cl. 260-534.00S.
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Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,045,551, Cl. 424-76.000.
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Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.
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Ohmori, Hitoshi, to Rank Xerox Ltd. Developing apparatus in electrocopying machines. 4,044,719, Cl. 118-652.000.
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Ohta, Jun, to Toyota Jidosha Kogyo Kabushiki Kaisha. Alarm indicating system. 4,045,794, Cl. 340-414.000.
Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, to Victor Company of Japan, Ltd. Recording system for a multichannel record disc. 4,045,621, Cl. 179-100.4ST.
Oishi, Kazuaki: *See*—
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Oka, Mitsunori: *See*—
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Okachi, Ryo: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
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Okada, Osamu: *See*—
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, 4,045,135, Cl. 355-11.000.
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Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Reducing gas sensor. 4,045,178, Cl. 23-254.00E.
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Okuma Machinery Works Ltd.: *See*—
Nakajima, Yosiharu, 4,044,573, Cl. 66-57.000.
Oldaeus, Karl Olof; Tordenmalm, Osten Lars; and Nilsson, Bo Nils, to Akermans Verkstad AB. Excavators. 4,044,610, Cl. 73-133.00R.
Olin Corporation: *See*—
Bhutani, Sudhir K.; and Nichols, Willard A., 4,045,502, Cl. 260-651.00F.
Blakely, Stephen W., 4,045,055, Cl. 285-33.000.
Bridendall, Philip R., Jr., 4,045,322, Cl. 204-263.000.
Maxwell, Clifford J., 4,045,378, Cl. 260-2.5AJ.
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Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, 4,045,076, Cl. 296-39.00A.
Oliver, Robert: *See*—
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Olsen, Emil M. Spring retainer for electric plugs. 4,045,108, Cl. 339-75.00P.
Olson, Robert H., to Mobil Oil Corporation. Thermoplastic bag dispensing assembly. 4,044,919, Cl. 221-63.000.
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Matsubara, Masaki, 4,045,127, Cl. 350-210.000.
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Germani, Cesare, 4,044,800, Cl. 139-341.000.
O'Neal, Larry. Venting valve for inflatable dock seals. 4,044,510, Cl. 52-2.000.
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, to Hitachi, Ltd. Refrigerator. 4,044,570, Cl. 62-419.000.
Ono Pharmaceutical Company: *See*—
Kurono, Masayasu; Nakai, Hisao; and Muryobayashi, Takashi, 4,045,468, Cl. 260-468.00D.
Onsager, Olav T.; and Szecsi, Peter L., to Halcon International, Inc. Preparation of ethylene glycol. 4,045,500, Cl. 260-635.00H.
Opletal, Josef, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Apparatus for orienting a flat workpiece. 4,044,884, Cl. 198-415.000.
Optische Werke G. Rodenstock: *See*—
Krahn, Wilhelm, 4,045,130, Cl. 351-24.000.
O'Rear, Jacques G.: *See*—
Griffith, James R.; and O'Rear, Jacques G., 4,045,408, Cl. 260-47.0EA.
Orentreich, Seymour; and Vogelman, Joseph. Cosmetic container including integrated lens structure. 4,044,889, Cl. 206-459.000.
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Holper, Frank, 4,045,626, Cl. 200-30.00R.
Orlov, Gennady Ivanovich: *See*—
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Ortec Incorporated: *See*—
Rolle, Rainer, 4,045,676, Cl. 250-272.000.
Ortiz, Erlinda P.: *See*—
Petrowski, Gary E.; Wolcott, John M.; and Ortiz, Erlinda P., 4,045,589, Cl. 426-609.000.
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Ostroff, Harold H., to McDonnell Douglas Corporation. Heat generator. 4,044,683, Cl. 102-90.000.
Otis Engineering Corporation: *See*—
Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., 4,044,827, Cl. 166-133.000.
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Ottmar, Peter H.: *See*—
Cronin, Paul W.; Ottmar, Peter H.; Root, Ernest F.; and Simmons, Harry M., 4,044,754, Cl. 126-271.000.
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Wick, Gerald H., 4,044,533, Cl. 56-11.300.
Overpeck, Max E.: *See*—
Pope, James W.; and Overpeck, Max E., 4,045,039, Cl. 279-123.000.
Owens-Corning Fiberglas Corporation: *See*—
Marzocchi, Alfred, 4,045,592, Cl. 427-45.000.
Owens-Illinois, Inc.: *See*—
Miller, John W. V., 4,045,790, Cl. 340-324.00M.
Mold, Donald F.; and Rice, Ronald G., 4,045,199, Cl. 65-33.000.
Salisbury, Charles W., 4,045,200, Cl. 65-42.000.
Owens, William T.; Davidson, Albin A.; and Nelson, Eldrid W., to Krautkramer-Branson, Incorporated. Ultrasonic track testing carriage. 4,044,594, Cl. 73-67.80S.
Oy Wiik & Hoglund Ab: *See*—
Jofs, Jar-Erik, 4,045,270, Cl. 156-229.000.

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Green, David L., 4,044,709, Cl. 116-129.00F.

Pagano, Victor H.; and Tasdemiroglu, Server; to United States of America, Army. Laminated armor-piercing projectile. 4,044,679, Cl. 102-52.000.

Paggen, Marvin Vernon: *See*—
Warthen, John Lawrence; Briggs, Warren Stanley; and Paggen, Marvin Vernon, 4,045,372, Cl. 252-463.000.

Pako Corporation: *See*—
Kellett, William B., 4,044,964, Cl. 242-58.000.

Palenschat, Dieter: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Palosi, Eva: *See*—
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.

Paoletti, Claude: *See*—
Le Pecq, Jean Bernard; Paoletti, Claude; and Dat-Xuong, Nguyen, 4,045,565, Cl. 424-263.000.

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Piccolo, Luigi; Bottai, Gabriele; Paolinelli, Antonio; and La Rovere, Angelo, 4,045,205, Cl. 71-31.000.

Paolino, Vincent J. Golf equipment storage device. 4,045,103, Cl. 312-198.000.

Papajohn, Elissa D. Panty with sanitary napkin holder. 4,044,769, Cl. 128-288.000.

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Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., 4,045,182, Cl. 23-288.00R.

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Green, Derek; Pardoe, John Alan; and Etherington, Clifford, 4,044,587, Cl. 72-261.000.

Parker, Trevor: *See*—
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Parker, Warde L.: *See*—
Lewis, Leon David; Wiher, Wilfried; and Parker, Warde L., 4,044,652, Cl. 91-368.000.

Parkes, David M.; and Hart, Thomas Brian, to Kaiser Resources Ltd. Pumpable product hydraulic mining apparatus and method. 4,045,086, Cl. 299-17.000.

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Parkinson, Harold B., to Topar Products Corporation. Printing ink composition. 4,045,232, Cl. 106-28.000.

Parsons, David; and Leigh-Monstevens, Keith Vernon, to Automotive Products Company Ltd. Driven plates for friction clutches. 4,044,873, Cl. 192-106.200.

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Bouton, John C.; Partin, Melvin E.; and Hilghman, Robert C., 4,045,772, Cl. 340-146.30B.

Parton, Kenneth Charles, to Reyrolle Parsons Limited. Current limiting devices for alternating current systems. 4,045,823, Cl. 361-58.000.

Paschelke, Gert: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

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McWhorter, Daniel M.; and Patel, Bhupendra C., 4,044,757, Cl. 128-2.00A.

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Reiber, Hans, 4,045,530, Cl. 264-92.000.

Patrick, John H., to Flex-O-Lators, Inc. Casket suspension. 4,044,436, Cl. 27-12.000.

Pattyn, Herman Alberik: *See*—
Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, 4,045,228, Cl. 96-64.000.

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Peake, Cecil Vowe. Mining apparatus. 4,045,087, Cl. 299-31.000.

Pearce, Daniel S., to GTE Sylvania Incorporated. Continuous DC control circuit. 4,045,775, Cl. 340-147.00R.

Pearlman, Alan R.; and Colin, Dennis P., to ARP Instruments, Inc. Touch sensitive polyphonic musical instrument. 4,044,642, Cl. 84-1.100.

Pearson, Raymond H. Deodorizing accessary for water closets. 4,044,408, Cl. 4-213.000.

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Blum, Jacques Marcel; Grenon, Michel; and Ventre, Edmond, 4,045,286, Cl. 176-49.000.

Pedain, Josef: *See*—
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Peltola, Veikko K.; and Duros, James M., to Alnor Instrument Co. Digitized linearizing correction apparatus with frequency modulation. 4,045,658, Cl. 235-151.300.

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Koch, Friedrich-Karl; and Schneiders, Hugo, 4,044,619, Cl. 74-53.000.

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Rod, Robert L.; Penick, Walter L., Jr.; and Heller, Henry B., 4,045,314, Cl. 204-151.000.

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Korenowski, Theodore Frank; Penland, Jerry Lee; and Ritzert, Chalmer John, 4,045,339, Cl. 210-45.000.

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Henze, Walter J.; and Thein, San, 4,044,489, Cl. 43-27.400.

Pennsylvania Coke Technology, Inc.: *See*—
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Sheppard, Chester S.; and MacLeay, Ronald E., 4,045,426, Cl. 260-174.000.
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Perrotta, Anthony J.: *See*—
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Peter Smith Associates (Carpet Importers) Limited: *See*—
Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, 4,045,605, Cl. 428-88.000.

Peters, Alan W.: *See*—
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Peters, Frederick E. Tennis racquet and ball carrier for bicycles. 4,044,934, Cl. 224-36.000.

Peters Machinery Company: *See*—
Rose, Edward; and Roth, Robert A., 4,044,885, Cl. 198-419.000.

Peterson, Carl M. Sink strainer device. 4,045,351, Cl. 210-238.000.

Peterson, Carl W., to International Telephone and Telegraph Corporation. Electrical termination device and method. 4,045,111, Cl. 339-97.00R.

Peterson, Clinton B. Cabinet structure and method of construction. 4,045,104, Cl. 312-257.00R.

Peterson, Harold J.; and Kressin, Wayne F., to Kusel Equipment Company. Apparatus for making cheese. 4,045,152, Cl. 425-419.000.

Peterson, Jerald G. Transportable folding crib. 4,044,411, Cl. 5-99.00A.

Peterson, Oscar Fredrick Allan. Yardage counter attachment for golf carts and the like. 4,044,471, Cl. 33-141.00R.

Peterson, Reuben E., to Jenoff, Incorporated. Mounting bracket for a heat detector switch. 4,045,761, Cl. 337-372.000.

Peterson, Robert J., to American Can Company. Silencer device for industrial burners. 4,045,157, Cl. 431-114.000.

Petro-Tex Chemical Corporation: *See*—
Cares, William Ronald, 4,045,370, Cl. 252-458.000.

Petroski, Daniel J. Hand gun holster. 4,044,930, Cl. 224-2.00C.

Petrowski, Gary E.; Wolcott, John M.; and Ortiz, Erlinda P., to Carnation Company. Fat emulsion product and process for producing the same. 4,045,589, Cl. 426-609.000.

Petry, Henry Alfred: *See*—
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Petzoldt, Karl: *See*—
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Pfaffli, Paul, to Sandoz Ltd. Organic compounds. 4,045,443, Cl. 260-293.530.

Pfizer Inc.: *See*—
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Hess, Hans-Jurgen E.; and Schaaf, Thomas K., 4,045,465, Cl. 260-464.000.
Sarges, Reinhard, 4,045,488, Cl. 260-576.000.

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Agback, Karl Hubert, 4,045,429, Cl. 260-207.000.
Pharris, Jack W., to Walcott, Ruth, a part interest. High speed, long range turbo-jet aircraft. 4,044,971, Cl. 244-7.00R.
Phelps Dodge Corporation: *See—*
Powers, Richard Mather, 4,045,211, Cl. 75-21.000.
Phillips, Bobby M.; and Gregory, Dale R., to Eastman Kodak Company. Process for making producer-colored fibers, yarns, films and related products. 4,045,529, Cl. 264-75.000.
Phillips, David E., to Simplimatic Engineering Co. Apparatus for guiding and cushioning a plurality of articles as they move into a container. 4,044,530, Cl. 53-248.000.
Phillips Petroleum Company: *See—*
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Hutson, Thomas, Jr.; and Kraus, Wayne P., 4,045,503, Cl. 260-652.50P.
Volz, Herbert A., 4,044,833, Cl. 166-307.000.
Piccolo, Luigi; Bottai, Gabriele; Paolinelli, Antonio; and La Rovere, Angelo, to Societa Italiana Resine S.I.R. S.p.A. Method for the manufacture of soil modifiers from waste material of the manufacture of titanium dioxide. 4,045,205, Cl. 71-31.000.
Pieper, Keith A.: *See—*
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Pierrot, Henri, to La Telemecanique Electrique. Quick make and break switch. 4,045,632, Cl. 200-67.0PK.
Piesik, Edward T., to General Dynamics Corporation. Rocket exhaust plenum flow control apparatus. 4,044,648, Cl. 89-1.800.
Pilling, Arnold V.: *See—*
McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., 4,044,555, Cl. 60-264.000.
Pioneer Electronic Corporation: *See—*
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Yashiro, Kenji; and Saeki, Yoshifumi, 4,045,732, Cl. 324-133.000.
Pippert, Aaron J., to Utex Industries, Inc. Packing. 4,045,037, Cl. 277-205.000.
Pitel, Ira Jay, to GTE Sylvania Incorporated. Tuned oscillator ballast circuit. 4,045,711, Cl. 315-209.00R.
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Pittet, Alan O.: *See—*
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Pless, William C.: *See—*
Goldstein, David; Pless, William C.; Shapiro, Michael; Spencer, Dana; and Starr, Leland E., Jr., 4,044,599, Cl. 73-12.000.
Poeth, Dean F.: *See—*
Trumbull, Harold E.; and Poeth, Dean F., 4,044,904, Cl. 214-152.000.
Polaroid Corporation: *See—*
Ellin, Seymour; and Sharp, John R., 4,045,806, Cl. 354-37.000.
Poliniak, Eugene Samuel: *See—*
Himics, Richard Joseph; Desai, Nitin Vithalbhai; and Poliniak, Eugene Samuel, 4,045,318, Cl. 204-192.00E.
Pollack, Joel M.; and Flannery, John B., to Xerox Corporation. Bistable deflection system. 4,045,124, Cl. 350-160.0LC.
Polysius AG: *See—*
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, 4,045,161, Cl. 432-80.000.
Pontarella, Armand. Tendon shield and method of making the same. 4,044,760, Cl. 128-82.000.
Poorbaugh, Charles R.; and Rhoads, Gerald A. Phase reversal protection system. 4,045,682, Cl. 307-127.000.
Pope, James W.; and Overpeck, Max E., to Wallace Murray Corporation. Adjustable clamping jaw for chucks. 4,045,039, Cl. 279-123.000.
Porner, Horst: *See—*
Schabert, Hans-Peter; Porner, Horst; and Bauer, Artur, 4,044,898, Cl. 214-18.00N.
Porter, George: *See—*
Boyd, Dennis; and Porter, George, 4,044,777, Cl. 131-2.000.
Portland Wire & Iron Works: *See—*
Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, 4,045,076, Cl. 296-39.00A.
Posey, Donald L. Multi-function measuring instrument. 4,044,469, Cl. 33-102.000.
Posso, Patrick P., to Societe Anonyme dite: GEFITEC S.A. Magnetic tape reel for computer. 4,044,965, Cl. 242-71.800.
Potter, John Thomas. Fish lure. 4,044,491, Cl. 43-42.220.
Pousche, Walter: *See—*
Fleisch, William F.; and Pousche, Walter, 4,045,090, Cl. 297-440.000.
Powderley, John, to USM Corporation. Blind rivet and improved method of blind riveting. 4,044,591, Cl. 72-391.000.
Powell, B. J.: *See—*
Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., 4,044,806, Cl. 144-309.0AC.
Powell, James LeRoy: *See—*
Eisner, Steve; and Powell, James LeRoy, 4,045,356, Cl. 225-2.000.
Powell, Russell A., to Koppers Company, Inc. Probe for obtaining gas samples from a shaft furnace. 4,044,612, Cl. 73-341.000.
Powers, Richard Mather, to Phelps Dodge Corporation. Method for increasing radiant heat transfer from hot gases. 4,045,211, Cl. 75-21.000.
PPG Industries, Inc.: *See—*
Bhardwaj, Mahesh C.; and Englert, William J., 4,045,203, Cl. 65-182.00R.
Brodmann, George L.; and Schlatter, Carl Nelson, 4,045,601, Cl. 427-381.000.
Cunningham, Hugh, 4,045,324, Cl. 204-268.000.
Drummond, Warren W., 4,045,195, Cl. 65-2.000.
Sare, Edward J.; and Lavanish, Jerome M., 4,045,538, Cl. 423-240.000.
Schaefer, William L., 4,045,196, Cl. 65-2.000.
Tsai, Yih-Wan; Sensi, John E.; and Henry, Vincent I., 4,045,197, Cl. 65-27.000.
Wallace, John F., 4,045,536, Cl. 264-327.000.
Prado Verde, Inc.: *See—*
Kunde, Donald M.; and Lagrimanta, Frank M., 4,045,138, Cl. 351-178.000.
Pragnell, Robert James: *See—*
Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, 4,045,380, Cl. 260-2.5HA.
Precision Flexmold, Inc.: *See—*
Maurino, William J.; and Putzer, Raymond M., 4,045,153, Cl. 425-440.000.
Preformed Line Products Co.: *See—*
Williams, Harrison L.; and Banhidy, Detre M., 4,045,665, Cl. 240-51.11R.
Preisenhammer, Peter, to Saurer-Allma GmbH Allgauer Maschinenbau. Toggle-lever power amplifier. 4,044,623, Cl. 74-520.000.
Preston, Edward George; and Rakowicz, Jan Antoni, to Molins Limited. Manufacture of filter-tipped cigarettes. 4,044,779, Cl. 131-21.00R.
Preston, John; and Reeve, Austin John, to Imperial Chemical Industries Limited. 6-Substituted-4-hydroxycinnolin-3-yl carboxylic acids and esters thereof. 4,045,439, Cl. 260-250.00C.
Preuss, Arnfried, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Direct reading temperature measuring bridge circuit. 4,044,613, Cl. 73-362.0AR.
Prichard, Daniel R.: *See—*
Stoessel, Herman V.; and Prichard, Daniel R., 4,044,557, Cl. 60-420.000.
Priese, Werner K., to Hills-McCanna Company. Pressure loaded sealing arrangement. 4,044,994, Cl. 251-172.000.
Prince, Luther T., Jr., to Ault Incorporated. Method of making a power-pack assembly. 4,044,458, Cl. 29-605.000.
Princeton Biomedix Incorporated: *See—*
Bulbenko, George F.; and Woodbridge, Joseph Eliot, 4,045,290, Cl. 195-99.000.
Printronix, Inc.: *See—*
Barrus, Gordon Brent; and Emenaker, Leo Joseph, 4,044,668, Cl. 101-93.040.
Procter & Gamble Company, The: *See—*
Adrion, David Martin; and Hartsough, Lloyd Bruce, 4,044,782, Cl. 132-7.000.
Fanta, Wayne I.; and Shulman, Joel I., 4,045,469, Cl. 260-469.000.
Luedders, Wilmer Louis; and Wetzel, Thomas Andrew, 4,045,548, Cl. 424-47.000.
Watt, David M., Jr.; and Nirschl, Joseph P., 4,045,361, Cl. 252-8.800.
Weigle, Dwight Carl, 4,045,590, Cl. 426-656.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Brouard, Claude Marie Henri Emile; and Ficht, Paulette Gisele, 4,045,423, Cl. 260-147.000.
Profile Systems, Inc.: *See—*
Maune, Neil F., 4,044,503, Cl. 49-400.000.
Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Organosilicone polymers. 4,045,381, Cl. 260-2.5AH.
Proksch, Gary J.; and Bonderman, Dean P. Preparation of optically clear serum. 4,045,176, Cl. 23-230.00B.
Properzi, Giulio. Continuous rolling mill. 4,044,586, Cl. 72-224.000.
Provost, Roger, to Institut Francais du Petrole. Apparatus for coating a surface with a pulverulent product. 4,044,717, Cl. 118-629.000.
Pryor, Clyde Robert: *See—*
Hollingsead, Robert A.; and Pryor, Clyde Robert, 4,044,515, Cl. 52-173.00R.
Pryor, Robert A.: *See—*
Coleman, Michael G.; and Pryor, Robert A., 4,045,245, Cl. 136-89.00C.
Pulver, Donald W. Automobile body frame and envelope construction. 4,045,075, Cl. 296-28.00J.
Punsmann, Josef; and Hecking, Ludger, to A. Friedr. Flender & Co. Coupling the switching of which is dependent on the rotational speed. 4,044,872, Cl. 192-103.00A.
Pursnani, Khiman K.; and Sepso, Roger P., to Robertshaw Controls Company. Electrical switch construction and improved overtravel switch blade therefor and method of making the same. 4,045,635, Cl. 200-283.000.

Putzer, Raymond M., to Resment Inc. Method of casting compositions in elastomeric molds. 4,045,535, Cl. 264-313.000.
Putzer, Raymond M.: *See—*
Maurino, William J.; and Putzer, Raymond M., 4,045,153, Cl. 425-440.000.
Pynsky, Raymond F., to dun-Rite Erectors, Inc. Can testing conveyor. 4,044,891, Cl. 209-73.000.
Quaker Oats Company, The: *See—*
Balaz, Alexander, 4,044,661, Cl. 99-355.000.
Quinones, Nicanor Quinones: *See—*
Hardy, Robert Allis, Jr.; and Quinones, Nicanor Quinones, 4,045,445, Cl. 260-293.590.
R. G. Dixon & Company Limited: *See—*
Wilkins, John Thomas, 4,044,848, Cl. 180-6.500.
Rabilloud, Guy; and Sillion, Bernard, to Institut Francais du Petrole. New di-substituted meta-terphenyl compounds and resulting polymers. 4,045,414, Cl. 260-65.000.
Radda, George J.: *See—*
Caffarella, Thomas E.; Radda, George J.; and Watts, David J., 4,045,201, Cl. 65-105.000.
Radke, Dietrich: *See—*
Wetzel, Rolf; and Radke, Dietrich, 4,045,214, Cl. 75-60.000.
Radler, Richard W., Jr., to Xerox Corporation. Possible active matrix polymers. 4,045,413, Cl. 260-63.00R.
Radtke, Charles Stephan: *See—*
LaCroce, Leonard Thomas; and Radtke, Charles Stephan, 4,044,915, Cl. 220-270.000.
Rahmstorf, Dietmar, to Messrs. BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag. Toy animal figures with interchangeable saddle and center body part. 4,044,498, Cl. 46-116.000.
Rakowicz, Jan Antoni: *See—*
Preston, Edward George; and Rakowicz, Jan Antoni, 4,044,779, Cl. 131-21.00R.
Ramachandran, Pallassana, to Colgate Palmolive Company. Softener and bleaching composition. 4,045,358, Cl. 252-8.600.
Ramsey, John W., Jr., to Guardpack, Incorporated. Inflatable dunnage with tie-downs. 4,044,693, Cl. 105-468.000.
Ranco Incorporated: *See—*
Biesecker, Frederick S., 4,044,823, Cl. 165-16.000.
Rank Xerox Ltd.: *See—*
Ohmori, Hitoshi, 4,044,719, Cl. 118-652.000.
Rapistan Incorporated: *See—*
Maxted, Wesley R., 4,044,897, Cl. 214-11.00R.
Rapoport, Henry; and Barber, Randy B., to United States of America, Health, Education and Welfare. Method of producing thebaine from codeine and oripavine from morphine. 4,045,440, Cl. 260-285.000.
Rasdall, Milton: *See—*
Worick, Richard A., 4,044,842, Cl. 172-314.000.
Rasi-Zade, Artur Tair ogly: *See—*
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.
Rasmussen, Claus Lowe, to Schublich A/S. Printing cylinder for printing machines. 4,044,678, Cl. 101-378.000.
Rassmann, Christoph: *See—*
Hauschopp, Alois; Schlusener, Horst; and Rassmann, Christoph, 4,045,089, Cl. 299-43.000.
Ratheiser, Heinz, to Krauss-Maffei Aktiengesellschaft. Die for extruding large-diameter tubing. 4,045,154, Cl. 425-467.000.
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, to Heraeus Quarzschmelze GmbH. Method of preparing a foreproduct for the production of an optical lightconductor. 4,045,198, Cl. 65-33.000.
Raudys, Vytas Andrew; and DeVitto, Ronald Robert, to Union Carbide Corporation. Apparatus and method for providing hanger-clip closures for casings. 4,044,450, Cl. 29-509.000.
Ravenhall, Richard, to United States of America, National Aeronautics and Space Administration. Platform for a swing root turbomachinery blade. 4,045,149, Cl. 416-135.000.
Raychem Corporation: *See—*
Troy, Michael, 4,045,612, Cl. 174-136.000.
Raychem Limited: *See—*
Clabburn, Robin J. T., 4,045,604, Cl. 428-36.000.
Raymond Lee Organization, Inc., The: *See—*
Fife, Clemens L., 4,045,069, Cl. 294-31.200.
Jamison, Leon L., 4,044,711, Cl. 116-124.00B.
RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 4,045,694, Cl. 307-296.00R.
Carlson, Curtis Raymond, 4,045,133, Cl. 355-1.000.
Dingwall, Andrew Gordon Francis, 4,045,250, Cl. 148-1.500.
Dingwall, Andrew Gordon Francis, 4,045,811, Cl. 357-41.000.
Himics, Richard Joseph; Desai, Nitin Vithalbhai; and Poliniak, Eugene Samuel, 4,045,318, Cl. 204-192.00E.
Hsu, Sheng Teng, 4,045,747, Cl. 330-35.000.
Salzer, William Ellsworth, 4,045,719, Cl. 363-89.000.
Schade, Otto Heinrich, Jr., 4,045,822, Cl. 361-45.000.
Stewart, Roger Green, 4,045,688, Cl. 307-251.000.
Wheatley, Carl Franklin, Jr., 4,045,746, Cl. 330-23.000.
Reardon, John: *See—*
McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., 4,044,555, Cl. 60-264.000.
Reardon, Paul J.: *See—*
Strauss, Bruce P.; Reardon, Paul J.; and Remsbottom, Robert H., 4,044,457, Cl. 29-599.000.
Recognition Equipment Incorporated: *See—*
Cave, Ellis K., 4,045,816, Cl. 358-212.000.
Reed, Marion G., to Chevron Research Company. Hydroxy-aluminum based drilling fluid. 4,045,357, Cl. 252-8.50A.
Reents, Margaret J.: *See—*
Weeks, Lloyd E.; Johnson, John H.; and Reents, Margaret J., 4,045,297, Cl. 195-103.50R.
Reeve, Austin John: *See—*
Preston, John; and Reeve, Austin John, 4,045,439, Cl. 260-250.00C.
Refrigeration Research, Inc.: *See—*
Bottum, Edward W.; and Rockwell, Frank H., 4,044,948, Cl. 237-1.00A.
Regie Nationale des Usines Renault: *See—*
Lemonnier, Jean-Yves; and Chatelain, Lucien, 4,045,521, Cl. 261-41.00R.
Rehn, Johnny: *See—*
Andersson, Lars; Rehn, Johnny; and Torstenfelt, Ragnar, 4,045,099, Cl. 308-36.000.
Reiber, Hans, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen m.b.H. Method of manufacturing shatterproof combustion type photoflash lamps. 4,045,530, Cl. 264-92.000.
Reichert, Donald G., to ABC Packaging Machine Corporation. Case erector. 4,044,657, Cl. 93-49.00M.
Reichmann, Horst, to Joh. Vaillant K.G. Circulating water heater. 4,044,726, Cl. 122-33.000.
Reid, Angus Joseph Dickson: *See—*
Forbes, Eric Simon; and Reid, Angus Joseph Dickson, 4,045,332, Cl. 208-323.000.
Reinecke, Guenter, to Benz & Hilgers GmbH. Apparatus for discharging stacked articles in discrete groups. 4,044,896, Cl. 214-8.50H.
Reisser, Fritz: *See—*
Muhle, Herbert; Milzner, Karlheinz; and Reisser, Fritz, 4,045,561, Cl. 424-251.000.
Remaley, Edward G.; Baker, Robert W.; and Meyer, Raymond J., to Aluminum Company of America. Low temperature sealing of anodized aluminum. 4,045,599, Cl. 427-333.000.
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, to California Institute of Technology. Ion-exchange hollow fibers. 4,045,352, Cl. 210-500.00M.
Remington Arms Company, Inc.: *See—*
Hutton, James C.; Bauman, Thomas G.; and Rowlands, Kenneth C., 4,044,487, Cl. 42-16.000.
Remsbottom, Robert H.: *See—*
Strauss, Bruce P.; Reardon, Paul J.; and Remsbottom, Robert H., 4,044,457, Cl. 29-599.000.
Rendahl, Karl Ingvar Fredrik: *See—*
Giesselmann, Hannes; and Rendahl, Karl Ingvar Fredrik, 4,044,701, Cl. 112-259.000.
Renet, Claude, to "Meci" Materiel Electrique de Controle et Industriel. Method for reducing the response time in oxygen measuring probes. 4,045,300, Cl. 204-1.00T.
Renfro Corporation: *See—*
Everhart, John R., 4,044,438, Cl. 28-147.000.
Rengo Co., Ltd.: *See—*
Tokuno, Masateru, 4,044,901, Cl. 214-89.000.
Renvall, Ilkka; and Mattila, Tapio, to Kemira Oy. Method for producing 5-nitro-2-furfuryl acetate. 4,045,453, Cl. 260-347.400.
Repke, Virginia L.: *See—*
Mesek, Frederick K.; and Repke, Virginia L., 4,044,768, Cl. 128-287.000.
Resment Inc.: *See—*
Putzer, Raymond M., 4,045,535, Cl. 264-313.000.
Reymond, Jean-Claude: *See—*
de Corlieu, Guy; and Reymond, Jean-Claude, 4,045,120, Cl. 350-96.00C.
Reynolds Metals Company: *See—*
Hrishikesan, Kizhakke G., 4,045,537, Cl. 423-119.000.
Reyrolle Parsons Limited: *See—*
Parton, Kenneth Charles, 4,045,823, Cl. 361-58.000.
Rheinstahl Aktiengesellschaft: *See—*
Schafer, Heinrich, 4,045,101, Cl. 308-194.000.
Rhoads, Gerald A.: *See—*
Poorbaugh, Charles R.; and Rhoads, Gerald A., 4,045,682, Cl. 307-127.000.
Rhone-Poulenc Industries: *See—*
Azemar, Michel; and Viglecca, Lucien, 4,045,185, Cl. 23-290.000.
Rice, Ronald G.: *See—*
Mold, Donald F.; and Rice, Ronald G., 4,045,199, Cl. 65-33.000.
Richard, Charles A.; and Barbee, John Philip, to Baker International Corporation. Concentric gravel pack with crossover tool and method of gravel packing. 4,044,832, Cl. 166-278.000.
Richards, Harvey J.; and Trivedi, Bhupendra C., to Ashland Oil, Inc. 7-(Alpha-methyl-alpha-alkenyl)substituted 8-hydroxyquinolines and process for the preparation thereof. 4,045,441, Cl. 260-289.0XA.
Richards, Willie James: *See—*
Howland, Robert Franklin; Mansky, Michael Herman; and Richards, Willie James, 4,045,586, Cl. 426-387.000.
Richter, Ferdinand Joseph, to American Cyanamid Company. Iodophor soap tissues. 4,045,364, Cl. 252-106.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.
Richter, Robert Horace, to Magnavox Company, The. Paperboard pallet. 4,044,981, Cl. 248-119.00R.
Rickard, Michael E. Medical restraint. 4,045,678, Cl. 250-451.000.

Ricoh Company, Ltd.: *See*—
Fujimura, Itaru; and Endo, Katutoshi, 4,045,217, Cl. 96-1.0LY.
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, 4,045,802, Cl. 346-140.00R.
Iwasaki, Kyuhachiro, 4,045,801, Cl. 346-140.00R.
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, 4,045,134, Cl. 355-3.00R.

Riddle, Dennis L., to Milliken Research Corporation. Vacuum slot coating apparatus. 4,044,716, Cl. 118-50.000.

Rieck, Gerald C.: *See*—
Abu-Akeel, Abdulhadi K.; and Rieck, Gerald C., 4,044,861, Cl. 188-1.00B.

Riegel, Herbert: *See*—
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 4,045,504, Cl. 260-669.00R.

Ring, Terry A., to Kaiser Aluminum & Chemical Corporation. Process for producing high density sintered alumina. 4,045,234, Cl. 106-62.000.

Risser, Roger L.; and Shriver, Joe E., to Sperry Rand Corporation. Wheel adjustment mechanism for a forage blower. 4,045,041, Cl. 280-43.170.

Ritter, Edmond Jean: *See*—
Kelly, Ralph; and Ritter, Edmond Jean, 4,045,550, Cl. 424-70.000.

Ritzert, Chalmer John: *See*—
Korenowski, Theodore Frank; Penland, Jerry Lee; and Ritzert, Chalmer John, 4,045,339, Cl. 210-45.000.

Riverbank Laboratories, Inc.: *See*—
Wohlert, Andrew M., 4,045,243, Cl. 134-1.000.

Robbins, William L.: *See*—
Krueger, Theodore H.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,044,816, Cl. 164-63.000.

Robert Brendle & Cie.: *See*—
Strahm, Anton, 4,044,590, Cl. 72-342.000.

Roberts, Lloyd L.: *See*—
Blechen, Frederick C.; and Roberts, Lloyd L., 4,044,975, Cl. 244-181.000.

Roberts, William, to Siragusa, Ross D. Outboard motor mounting assembly and servo mechanism therefor. 4,044,705, Cl. 115-41.0HT.

Robertshaw Controls Company: *See*—
Bauer, Werner R., 4,045,759, Cl. 337-301.000.
Marquis, Edgar E.; and Knecht, William A., 4,045,760, Cl. 337-301.000.
Pursnani, Khiman K.; and Sepso, Roger P., 4,045,635, Cl. 200-283.000.
Wolfe, Denis G.; and Danon, Joseph S., 4,045,155, Cl. 431-42.000.

Robinson, Paul E., to Sabco Limited. Mop wringer. 4,044,419, Cl. 15-119.00A.

Robson, John Howard; and Marcus, Erich, to Union Carbide Corporation. Amine acrylate addition reaction product compositions. 4,045,416, Cl. 260-77.5CR.

Roby, Ray I., to Roby's Enterprises, Inc. Adhesive composition. 4,045,395, Cl. 260-28.5AS.

Roby's Enterprises, Inc.: *See*—
Roby, Ray I., 4,045,395, Cl. 260-28.5AS.

Rock, Erich; and Mages, Bernhard. Pull-out guide. 4,045,097, Cl. 308-3.800.

Rockwell, Frank H.: *See*—
Bottum, Edward W.; and Rockwell, Frank H., 4,044,948, Cl. 237-1.00A.

Rockwell International Corporation: *See*—
Schelat, Thomas A., 4,044,997, Cl. 251-328.000.
Sutherland, Ray, 4,044,787, Cl. 137-107.000.

Rockwell-Rimoldi S.p.A.: *See*—
Marforio, Nerino, 4,044,699, Cl. 112-200.000.

Rod, Robert L.; Penick, Walter L., Jr.; and Heller, Henry B., to Monogram Industries, Inc. Waste evaporation disposal system. 4,045,314, Cl. 204-151.000.

Rodco, Inc.: *See*—
Payne, Bobby L., 4,045,591, Cl. 427-37.000.

Rodondi, Andrew F.; and Hommer, Martin H., to General Motors Corporation. Unitary insulator housing with secondary latch means and electrical connector utilizing same. 4,045,112, Cl. 339-99.00R.

Rodrigue, Normand N., to McDonnell Douglas Corporation. Self re-arming valve. 4,044,790, Cl. 137-465.000.

Rogers, Alan Barde, to Armour and Company. Process for pasteurizing raw poultry. 4,045,579, Cl. 426-327.000.

Rogers Corporation: *See*—
Ankrom, Albert M.; and Vernon, John T., 4,044,427, Cl. 19-97.000.

Rogic, Milorad M.; Swerdloff, Michael D.; and Demmin, Timothy R., to Allied Chemical Corporation. Synthesis of α-nitrosoketal dimers. 4,045,422, Cl. 260-143.000.

Rohm and Haas Company: *See*—
Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., 4,045,517, Cl. 260-901.000.

Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 1,3,4,5-Tetrahydro-2H-1,4-benzodiazepin-2-ones. 4,045,433, Cl. 260-239.30D.

Rolle, Rainer, to Ortec Incorporated. Determining element concentrations in samples. 4,045,676, Cl. 250-272.000.

Romagnolo, Gerard, to Ugine Carbone. Cutting plate with chip breakers. 4,044,439, Cl. 29-95.00R.

Roman, Steven A., to Shell Oil Company. Esters of nitrotetrahydro-2H-1,3-thiazin-2-ylidene)acetic acids. 4,045,434, Cl. 542-413.000.

Roman, Steven A., to Shell Oil Company. Use as insecticides of esters of nitro(tetrahydro-2H-1,3-thiazin-2-ylidene)acetic acids. 4,045,559, Cl. 424-246.000.

Romano, Ugo; and Tesei, Renato, to Anic, S.p.A. Process for the preparation of aromatic carbonates. 4,045,464, Cl. 260-463.000.

Ronson Corporation: *See*—
Kolodziej, Alojzy Antoni, 4,044,636, Cl. 76-104.00R.

Root, Ernest F.: *See*—
Cronin, Paul W.; Ottmar, Peter H.; Root, Ernest F.; and Simmons, Harry M., 4,044,754, Cl. 126-271.000.

Ropp, Dale R.: *See*—
Egert, Allen C.; Koutsky, L. John; and Ropp, Dale R., 4,045,082, Cl. 297-357.000.

Rose, Edward; and Roth, Robert A., to Peters Machinery Company. Method and apparatus for counting and loading items, particularly cookies, into packages and the like. 4,044,885, Cl. 198-419.000.

Rosenberger, Michael, to Hoffmann-La Roche Inc. 1-(2,6,6-Trimethyl-3-hydroxy or lower alkanoyloxycyclohexen-1-yl)-3-methyl-4-penten-1-yn-3-ol compound. 4,045,476, Cl. 260-488.00R.

Rosenberger, Michael: *See*—
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,045,452, Cl. 260-345.90S.

Rosenberger, Roy R.: *See*—
Dolan, Jerome J.; and Rosenberger, Roy R., 4,045,733, Cl. 324-140.00R.

Rosenkranz, Hans Jurgen: *See*—
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H.

Rosewell, Michael P. Nuclear reactor fuel containment safety structure. 4,045,284, Cl. 176-38.000.

Roth, Robert A.: *See*—
Rose, Edward; and Roth, Robert A., 4,044,885, Cl. 198-419.000.

Rounds, Hugh G.: *See*—
Schoenrock, Karlheinz W. R.; and Rounds, Hugh G., 4,045,242, Cl. 127-50.000.

Rourke, Michael H.: *See*—
Babayan, Eduard P.; and Rourke, Michael H., 4,045,527, Cl. 264-46.700.

Roussel Uclaf: *See*—
Clemence, Francois; and Le Martret, Odile, 4,045,567, Cl. 424-270.000.
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,045,209, Cl. 71-98.000.

Rowbottam, Francis W., to New England Business Service, Inc. Time indicating apparatus and transmission mechanism therefor. 4,044,548, Cl. 58-125.00C.

Rowland, Stanley P., to United States of America, Agriculture. Textiles flame retarded with hydroxymethylphosphorus compounds in combination with poly(ethyleneureas) and poly(N-methylolethyleneureas). 4,045,173, Cl. 8-116.00P.

Rowlands, Kenneth C.: *See*—
Hutton, James C.; Bauman, Thomas G.; and Rowlands, Kenneth C., 4,044,487, Cl. 42-16.000.

Rubin, Isaac D.; and Nebzydoski, John W., to Texaco Inc. Synthetic turbine oils. 4,045,376, Cl. 252-56.00S.

Rubin, Philip N.; and Fleming, Michael, to Fairfield Fiberglass Inc. In ground swimming pool framework. 4,044,514, Cl. 52-169.700.

Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, to Siemens Aktiengesellschaft. Method for the preparation of layer structures. 4,045,223, Cl. 96-35.100.

Rudolph, Hans: *See*—
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H.

Rumpp, Gerhard; Kruger, Wilm; and Scholz, Dieter, to Hilti Aktiengesellschaft. Drilling tool with a two part input unit. 4,044,845, Cl. 175-409.000.

Russ, Daniel G., to Telectro-Mek, Inc. Portable contaminated fuel detector with tiered deck. 4,044,604, Cl. 73-61.00R.

Russ, Daniel G., to Telectro-Mek, Inc. Compact portable contaminated fuel detector with hand-operated pump. 4,045,139, Cl. 356-36.000.

Russo, Giovanni: *See*—
Pasqualini, Ugo; and Russo, Giovanni, 4,044,466, Cl. 32-10.00A.

Ryason, Porter R.: *See*—
United States of America, National Aeronautics and Space Administration; and Ryason, Porter R., 4,045,315, Cl. 204-157.10R.

Rychen, Niklaus; and Fuchshuber, Peter Werner, to Konus-Kessel Gesellschaft fur Warmetechnik mbH & Co. KG. Apparatus for heating a heat transfer fluid protected against overheating. 4,044,727, Cl. 122-449.000.

S.A.E.S. Getters S.p.A.: *See*—
Cantaluppi, Angelo, 4,045,369, Cl. 252-432.000.

S&C Electric Company: *See*—
Biller, Bruce A.; and Scherer, Henry W., 4,045,758, Cl. 337-186.000.
Foulkes, John F., 4,045,762, Cl. 337-401.000.

Saab-Scania AB: *See*—
Brunnert, Stig Erik, 4,044,913, Cl. 220-86.00R.

Sabco Limited: *See*—
Robinson, Paul E., 4,044,419, Cl. 15-119.00A.

Saeki, Yoshifumi: *See*—
Yashiro, Kenji; and Saeki, Yoshifumi, 4,045,732, Cl. 324-133.000.

Saeki, Yoshito: *See*—
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,045,551, Cl. 424-76.000.

Saffren, Melvin M.: *See*—
United States of America, National Aeronautics and Space Administration; and Saffren, Melvin M., 4,045,359, Cl. 250-527.000.

Saito, Mitsuo: *See*—
Kinugasa, Akikazu; Okuda, Toshio; Goto, Makoto; and Saito, Mitsuo, 4,045,450, Cl. 260-343.600.

Saito, Mitsuru, to Minolta Camera Kabushiki Kaisha. Automatic focusing apparatus. 4,045,805, Cl. 354-25.000.

Saito, Teruo: *See*—
Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, 4,045,388, Cl. 260-17.4ST.

Saito, Toru: *See*—
Hirano, Mikio; Takeshima, Masaki; Saito, Toru; and Shimozato, Atou, 4,045,539, Cl. 423-240.000.

Saito, Yasushi: *See*—
Kamimura, Shoji; and Saito, Yasushi, 4,045,669, Cl. 250-311.000.

Saitoi, Takeji: *See*—
Urai, Muneharu; Kogure, Koji; and Haraguchi, Youichiro, 4,044,715, Cl. 118-50.000.

Sakaedani, Yoshiyasu: *See*—
Fujisawa, Kenzo; Sakaedani, Yoshiyasu; and Tsuji, Akio, 4,044,475, Cl. 35-6.000.

Sakai, Katsuo: *See*—
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, 4,045,134, Cl. 355-3.00R.

Sakamoto, Koji: *See*—
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, 4,045,134, Cl. 355-3.00R.

Sakoda, Tom Kenzo: *See*—
Breslow, Jeffrey D.; Jaworski, Eugene; and Sakoda, Tom Kenzo, 4,045,024, Cl. 273-43.00A.

Sakurai, Yo; Obayashi, Hidehito; and Gejyo, Tetsuo, to Hitachi, Ltd. Smoke and gas sensor element. 4,044,601, Cl. 73-23.000.

Saladin, Emil: *See*—
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,045,518, Cl. 260-927.00R.

Saleil, Jean: *See*—
Leroy, Pierre; Morlet, Jean Georges; and Saleil, Jean, 4,045,215, Cl. 75-82.000.

Salisbury, Charles W., to Owens-Illinois, Inc. Method of forming glass substrates with pre-attached sealing media. 4,045,200, Cl. 65-42.000.

Salyers, John C.: *See*—
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,044,914, Cl. 220-93.000.
Liberman, Harvey W.; and Salyers, John C., 4,044,905, Cl. 214-152.000.

Salzer, William Ellsworth, to RCA Corporation. Regulated voltage source. 4,045,719, Cl. 363-89.000.

Samcoe Holding Corporation: *See*—
Bryan, Clifford Chandler, 4,044,434, Cl. 26-18.500.

Samoilov, Jury Alexandrovich: *See*—
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.

Sampei, Tohru, to Hitachi, Ltd. Low-frequency power amplifier. 4,045,744, Cl. 330-13.000.

Sanders, Thomas J., to Harris Corporation. Process for fabricating diffused complementary field effect transistors. 4,045,259, Cl. 148-188.000.

Sandoz Ltd.: *See*—
Bream, John Bernard, 4,045,572, Cl. 424-275.000.
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,045,573, Cl. 424-279.000.
Muhle, Herbert; Milzner, Karlheinz; and Reisser, Fritz, 4,045,561, Cl. 424-251.000.
Pfaffli, Paul, 4,045,443, Cl. 260-293.530.

Sansui Electric Co., Inc.: *See*—
Kobayashi, Fumio, 4,044,855, Cl. 181-151.000.

Santacroce, James D.: *See*—
Lewicki, Lester R.; and Santacroce, James D., 4,044,400, Cl. 2-421.000.

Santi, Mario: *See*—
Cini, Carlo; Murari, Bruno; and Santi, Mario, 4,045,745, Cl. 330-15.000.

Sanyo Electric Co., Ltd.: *See*—
Hayashi, Gentaro; Yamamoto, Kenji; and Yamamoto, Yasakao, 4,044,626, Cl. 74-573.00F.

Sardella, Louis M., to Wm. C. Staley Machinery Corporation. Rotary feeder for paperboard blanks. 4,045,015, Cl. 271-112.000.

Sardisco, John B., to Pennzoil Company. Production of potassium sulfate and hydrogen chloride. 4,045,543, Cl. 423-482.000.

Sare, Edward J.; and Lavanish, Jerome M., to PPG Industries, Inc. Catalytic oxidation of vinyl chloride. 4,045,538, Cl. 423-240.000.

Saretzky, Horst, to De Limon Fluhme & Co. Adjustable progressive distributor valve. 4,044,924, Cl. 222-250.000.

Sarges, Reinhard, to Pfizer Inc. Aminophenyltetralin compounds. 4,045,488, Cl. 260-576.000.

Sarnezki, Herbert: *See*—
Daffner, Erich; and Sarnezki, Herbert, 4,045,706, Cl. 315-3.500.

Sasamura, Kohei: *See*—
Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, 4,045,621, Cl. 179-100.4ST.

Sasgen, Anthony M. Door stop. 4,044,424, Cl. 16-85.000.

Sato, Hiromi: *See*—
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,045,560, Cl. 424-248.400.

Sato, Kouzo: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kouzo; and Shinozaki, Nobuo, 4,045,627, Cl. 200-37.00R.

Sato, Seiji: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.

Sato, Tomoyasu: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.

Satoshi, Takeuchi, to Dai Nippon Printing Co., Ltd. Method for the electrolytic etching of metal workpiece. 4,045,312, Cl. 204-129.650.

Saucy, Gabriel: *See*—
Chan, Ka-Kong; and Saucy, Gabriel, 4,045,475, Cl. 260-488.00H.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,045,452, Cl. 260-345.90S.

Saurer-Allma GmbH Allgauer Maschinenbau: *See*—
Preisenhammer, Peter, 4,044,623, Cl. 74-520.000.

Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., to Powell, B. J., a part interest. Tree processing machine. 4,044,806, Cl. 144-309.0AC.

Savarese, Joseph. Apparatus for continuous cheese making. 4,044,662, Cl. 99-460.000.

Savarimuthu, Sundar. Vehicle suction brake. 4,044,862, Cl. 188-5.000.

Savio, Ermanno: *See*—
Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno, 4,044,962, Cl. 242-47.050.

Sawamura, Tagayasu: *See*—
Mori, Yasamasu; Ashiuchi Kenzo; Yasytome, Osamu; and Sawamura, Tagayasu, 4,045,703, Cl. 313-497.000.

Say, Geoffrey R.: *See*—
Wheelock, Kenneth S.; and Say, Geoffrey R., 4,045,371, Cl. 252-462.000.

Schaaf, Thomas K.: *See*—
Hess, Hans-Jurgen E.; and Schaaf, Thomas K., 4,045,465, Cl. 260-464.000.

Schabert, Hans-Peter; Porner, Horst; and Bauer, Artur, to Kraftwerk Union Aktiengesellschaft. Reactor fuel assembly lock transport. 4,044,898, Cl. 214-18.00N.

Schachter, Herbert I. Method of mounting prefabricated contacts for printed circuit card connectors. 4,044,460, Cl. 29-628.000.

Schachter, Herbert I. Prefabricated contacts for printed circuit card connectors. 4,044,888, Cl. 206-330.000.

Schade, Otto Heinrich, Jr., to RCA Corporation. Ground fault interrupter apparatus. 4,045,822, Cl. 361-45.000.

Schaefer, David H.; and Strong, James P., III, to United States of America, National Aeronautics and Space Administration. Analog to digital converter for two-dimensional radiant energy array computers. 4,045,792, Cl. 340-347.0AD.

Schaefer, William L., to PPG Industries, Inc. Method and apparatus for chopping glass strands. 4,045,196, Cl. 65-2.000.

Schafer, Heinrich, to Rheinstahl Aktiengesellschaft. Mounting for multi-worms in transmissions for driving multi-worm presses for processing synthetic material. 4,045,101, Cl. 308-194.000.

Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Albert, to Hoechst Aktiengesellschaft. Purification of sulfuric acid containing acetic acid. 4,045,295, Cl. 203-79.000.

Schafer, Werner: *See*—
Lange, Wolfgang; and Schafer, Werner, 4,045,274, Cl. 156-492.000.

Schalit, Samuel: *See*—
Cutler, Royal A.; and Schalit, Samuel, 4,045,483, Cl. 260-552.00R.

Schaub, Wolfgang: *See*—
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,045,448, Cl. 260-326.50B.

Scheffel, John W.: *See*—
Fischer, Paul W.; and Scheffel, John W., 4,045,360, Cl. 252-8.300.

Scheibler Peltzer & Co.: *See*—
Schneider, Axel, 4,044,966, Cl. 242-77.100.

Schelat, Thomas A., to Rockwell International Corporation. Seat ring notch for gate valve guide rail. 4,044,997, Cl. 251-328.000.

Schenker, Karl: *See*—
Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, 4,045,580, Cl. 424-330.000.

Scherer, Henry W.: *See*—
Biller, Bruce A.; and Scherer, Henry W., 4,045,758, Cl. 337-186.000.

Schering Aktiengesellschaft: *See*—
Drawert, Manfred; Griebsch, Eugen; and Imoehl, Wolfgang, 4,045,389, Cl. 260-18.00N.
Itil, Turan M.; and Herrmann, Werner Martin, 4,045,562, Cl. 424-261.000.
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.
Senge, Gerd; and Voss, Gunter, 4,045,306, Cl. 204-55.00R.

Schienda, John W., to I-T-E Imperial Corporation. Interlock for handles of adjacent circuit breakers. 4,045,628, Cl. 200-50.00C.

Schiess, Georg; and Heinzer, Jorg. Circular cutting device. 4,044,464, Cl. 30-164.900.

Schindler, Harvey D.: *See*—
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 4,045,504, Cl. 260-669.00R.
Schlatter, Carl Nelson: *See*—
Brodmann, George L.; and Schlatter, Carl Nelson, 4,045,601, Cl. 427-381.000.
Schleich, Josef; and Zwisler, Hans, to Heilmann & Littmann Bau-Aktiengesellschaft. Clarification plant. 4,045,355, Cl. 210-532.00R.
Schlichte, Max, to Siemens Aktiengesellschaft. Telecommunication switching network having a multistage reversed trunking arrangement. 4,045,617, Cl. 179-15.0AT.
Schloss, Benjamin. Apparatus for cardiovascular conditioning and other physiological purposes. 4,044,772, Cl. 128-371.000.
Schlosser, Hermann: *See*—
Kuster, Jurgen; and Schlosser, Hermann, 4,045,342, Cl. 210-81.000.
Schlusener, Horst: *See*—
Hauschopp, Alois; Schlusener, Horst; and Rassmann, Christoph, 4,045,089, Cl. 299-43.000.
Schmid, Erich: *See*—
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 4,045,570, Cl. 424-275.000.
Schmid, Walter: *See*—
Wilfert, Karl; Schmid, Walter; and Jambor, Arno, 4,045,052, Cl. 280-701.000.
Schmidt-Kastner, Gunter: *See*—
Kutzbach, Carl; Arens, Alfred; and Schmidt-Kastner, Gunter, 4,045,552, Cl. 424-94.000.
Schmitt, Marvin G., to AMI Industries, Inc. Power steering system for heavy load dollies. 4,044,854, Cl. 180-140.000.
Schmitz, Reinold: *See*—
Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, 4,045,457, Cl. 260-381.000.
Schmoll, Kurt: *See*—
Klein, Gerd; and Schmoll, Kurt, 4,045,385, Cl. 260-15.000.
Schneider, Axel, to Scheibler Peltzer & Co. Take-up frame for pile fabric. 4,044,966, Cl. 242-77.100.
Schneider, Richard S.: *See*—
Soffer, Michael J.; and Schneider, Richard S., 4,045,420, Cl. 260-112.00R.
Schneiders, Hugo: *See*—
Koch, Friedrich-Karl; and Schneiders, Hugo, 4,044,619, Cl. 74-53.000.
Schober, William R.: *See*—
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Schoenholz, Daniel: *See*—
Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, 4,045,581, Cl. 426-3.000.
Schoenrock, Karlheinz W. R.; and Rounds, Hugh G., to Amalgamated Sugar Company, The. Process for the purification of sugarbeet juice and the reduction of lime salts therein. 4,045,242, Cl. 127-50.000.
Schold, George R. Apparatus for dispersing finely divided solid particles in a liquid vehicle. 4,044,957, Cl. 241-46.110.
Scholz, Dieter: *See*—
Rumpp, Gerhard; Kruger, Wilm; and Scholz, Dieter, 4,044,845, Cl. 175-409.000.
Schrag, Thomas Gene; Burkhart, Merle Keith; and Garrison, Harold Keith, to Hesston Corporation. Multiple round bale mover. 4,044,906, Cl. 214-506.000.
Schreiber, William L.; and Pittet, Alan O., to International Flavors & Fragrances Inc. Processes for producing alkenals and intermediates therefor. 4,045,497, Cl. 260-615.00A.
Schroeder, Harry; and Aidn, Martin, to Siemens Aktiengesellschaft. Armature mounting means for an electromagnetic relay. 4,045,755, Cl. 335-274.000.
Schroetter, Gerhard: *See*—
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Schroter, Richard C., to Kaiser Aluminum & Chemical Corporation. Insulated tank jacketing system. 4,044,517, Cl. 52-248.000.
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Rasmussen, Claus Lowe, 4,044,678, Cl. 101-378.000.
Schuessler, John C.; and Tapp, David J., to Leach Corporation. Arc barrier for a relay switch. 4,045,751, Cl. 335-201.000.
Schultz, Arthur Harry. Bubble-making apparatus and means for attachment to a bicycle. 4,045,049, Cl. 280-289.00R.
Schuman, Cary. Golf putting aid. 4,045,033, Cl. 273-188.00R.
Schumann, Reinhard: *See*—
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Schwarz, Hans-Helmut: *See*—
Krall, Hermann-Dieter; and Schwarz, Hans-Helmut, 4,045,486, Cl. 260-566.00R.
Schweim, Klaus: *See*—
Sturmer, Horst; and Schweim, Klaus, 4,044,522, Cl. 52-599.000.
Schweitzer, Edmund O., Jr. Tool for manually tripping a fault indicator for high voltage electric power circuits and resetting same. 4,045,726, Cl. 324-51.000.
Schwerdtel, Wulf: *See*—
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Schwertner, Eberhard; and Herrling, Siegfried. Dipeptide derivatives, process for manufacture and pharmaceutical preparations. 4,045,556, Cl. 424-177.000.
Schwickart, Karl-Josef; and Sesterhenn, Lothar, to Bayer Aktiengesellschaft. Membrane seal for electrolysis plate and frame assemblies. 4,045,325, Cl. 204-286.000.
Scifres, Donald R.: *See*—
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SCM Corporation: *See*—
Shafer, William M.; and Nadkarni, Anil V., 4,045,644, Cl. 219-119.000.
Scopaz, Joseph T., to Bendix Corporation, The. Self testing monitoring apparatus for multiplexed digital input signals. 4,045,662, Cl. 235-153.00A.
Scott, Blayney J. Downrigger for trolling. 4,044,968, Cl. 242-106.000.
Scott, Keith. Taximeters. 4,045,656, Cl. 235-92.0TC.
Scovill Manufacturing Company: *See*—
Aureli, William D., 4,044,433, Cl. 24-227.000.
Sealed Power Corporation: *See*—
Shunta, Rudolph C., 4,045,036, Cl. 277-138.000.
Searle, Robert J. G.; and Boyce, Clive B. C., to Shell Oil Company. Thioamide pesticides. 4,045,575, Cl. 424-305.000.
Sears Manufacturing Co.: *See*—
Egert, Allen C.; Koutsky, L. John; and Ropp, Dale R., 4,045,082, Cl. 297-357.000.
Seaton, William Wayne, to Combustion Engineering, Inc. Ladle with axis of rotation through discharge spout. 4,044,927, Cl. 222-604.000.
Secretary of State for Social Services: *See*—
Bunce, Roger Abraham, 4,045 179, Cl. 23-259.000.
Segale, Luigi; and Passerini, Pier Enrico. Method of packaging products to be preserved under vacuum or atmosphere of suitable gases. 4,044,524, Cl. 53-22.00A.
Segerman, Morton. Tray for string jewelry items. 4,044,446, Cl. 29-241.000.
Seidel, William Carl: *See*—
Nazarenko, Nicholas; and Seidel, William Carl, 4,045,495, Cl. 260-606.50B.
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., to United States of America, Energy Research and Development Administration. Nuclear reactor containment structure with continuous ring tunnel at grade. 4,045,289, Cl. 176-87.000.
Seidov, Gasan Neimat ogly: *See*—
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for the hydroxylation of phenols and phenol ethers in the nucleus. 4,045,496, Cl. 260-613.00D.
Seiko Koki Kabushiki Kaisha: *See*—
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Seitz-Werke GmbH: *See*—
Kuster, Jurgen; and Schlosser, Hermann, 4,045,342, Cl. 210-81.000.
Sekiya, Fukuo: *See*—
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Selcuk, M. Kudret: *See*—
United States of America, National Aeronautics and Space Administration; and Selcuk, M. Kudret, 4,044,753, Cl. 126-271.000.
Sell, Earl O.: *See*—
Wieder, Rodney L.; Neetz, Michael A.; and Sell, Earl O., 4,045,067, Cl. 294-15.000.
Sender, Wilfred E. System for handling structural members. 4,044,886, Cl. 198-488.000.
Senge, Gerd; and Voss, Gunter, to Schering Aktiengesellschaft. Electroplating zinc and bath therefor. 4,045,306, Cl. 204-55.00R.
Sensi, John E.: *See*—
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Serkov, Arkady Trofimovich; Budnitsky, Gennady Alfeevich; Sokolovsky, Boris Matveevich; and Lezhnev, Vyacheslav Kapitonovich. Process of producing viscose yarn. 4,045,532, Cl. 264-196.000.
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Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, to Hoechst Aktiengesellschaft. Process for preparing copolymers of trioxane. 4,045,415, Cl. 260-67.0FP.
SGS-ATES Componenti Elettronici S.p.A.: *See*—
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Hall, John Ives, 4,044,761, Cl. 128-90.000.
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Humphries, Stanley, Jr.; and Sudan, Ravindra N., 4,045,677, Cl. 250-423.00R.
Sue, Harry: *See*—
Jones, Robert K.; and Sue, Harry, 4,045,310, Cl. 204-129.400.
Sulzer Bros. (U.K.) Limited: *See*—
Wassermann, Eberhard, 4,045,281, Cl. 162-214.000.
Sumitomo Chemical Company, Limited: *See*—
Iwahashi, Shunji; Morizane, Fukuichi; and Kato, Yasuyuki, 4,045,514, Cl. 260-873.000.
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.
Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, 4,045,388, Cl. 260-17.4ST.
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,045,560, Cl. 424-248.400.
Yamada, Eiji; Fukasawa, Akira; and Masaki, Shinzaburo, 4,045,454, Cl. 260-369.000.
Yamazaki, Noboru; and Higashi, Fukuji, 4,045,417, Cl. 260-78.00A.
Sumiyoshi, Masaharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation valve. 4,044,735, Cl. 123-119.00A.
Summerfield, Francis, to Alvasum (Aseptic) Limited. Flexible tubular members and valves incorporating such members. 4,044,990, Cl. 251-8.000.
Summers, Christopher Edward: *See*—
Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, 4,045,605, Cl. 428-88.000.
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. 2-Morpholine containing methano or ethano anthracene compounds. 4,045,560, Cl. 424-248.400.
Sundin, Anders Eric: *See*—
Forsgren, Ernst Erik, 4,044,525, Cl. 53-24.000.
Sunjic, Vitomir: *See*—
Kajfez, Franjo; Blazevic, Nikola; and Sunjic, Vitomir, 4,045,569, Cl. 424-274.000.
Suntech, Inc.: *See*—
Nickol, Stephen L., 4,045,511, Cl. 260-857.0TW.
Thompson, Robert M.; and Nickol, Stephen L., 4,045,512, Cl. 260-857.0TW.
Suspa Federungstechnik Fritz Bauer & Sohne OHG: *See*—
Bauer, Fritz, 4,045,008, Cl. 267-120.000.
Sutherland, Byron, to Walker-Hall-Sears, Inc. Multi-contact connectors with identical contacts. 4,045,107, Cl. 339-48.000.
Sutherland, Ray, to Rockwell International Corporation. Backflow preventer and relief valve assembly. 4,044,787, Cl. 137-107.000.
Suzuki, Hiroo; and Takada, Isao, to Toyo Ink Mfg. Co., Ltd. Curable aqueous coating composition. 4,045,399, Cl. 260-29.60N.
Suzuki, Isao: *See*—
Yanagawa, Itiro; and Suzuki, Isao, 4,045,094, Cl. 303-22.00R.
Suzuki, Kenichi: *See*—
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Adachi, Fumio, 4,045,478, Cl. 260-530.00N.
Suzuki, Ryuichi; and Suzuki, Takaji, to Hitachi, Ltd. Automatic cytoscreening device. 4,045,655, Cl. 235-92.0PC.
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, to Ricoh Company, Ltd. Photosensitive member for use in electrophotographic apparatus and method of manufacturing the same. 4,045,134, Cl. 355-3.00R.
Suzuki, Takaji: *See*—
Suzuki, Ryuichi; and Suzuki, Takaji, 4,045,655, Cl. 235-92.0PC.
Svenska Tobaks Aktiebolaget: *See*—
Falke, Erik, 4,045,657, Cl. 235-151.100.
Sverre Munck A/S: *See*—
Vikre, Lauritz, 4,044,858, Cl. 182-82.000.
Swain, William H. Electro-chemical concentration transducer and its use to measure and control acid strength and storage battery charge. 4,045,721, Cl. 320-43.000.
Swainson, Ralph V. Pipe tobacco tamper and method. 4,044,807, Cl. 131-243.000.
Swanson, Eugene Addison: *See*—
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 4,045,534, Cl. 264-237.000.
Swanson, Morton C. No till seed drill. 4,044,697, Cl. 111-66.000.
Swanstrom, Paul W. Remotely operated window shutters. 4,044,812, Cl. 160-206.000.
Swartzendruber, Ray E., to Chore-Time Equipment, Inc. Load cell and control for bulk bin. 4,044,920, Cl. 222-58.000.
Swaskey, Henry S. Basement sewer trap. 4,045,346, Cl. 210-164.000.
Swearingen, Charles C.; and Sheptak, Nicholas, to Dow Chemical Company, The. Cable shielding tape. 4,045,607, Cl. 428-200.000.
Sweeney, William A.: *See*—
Simic, Milutin; and Sweeney, William A., 4,045,506, Cl. 260-677.00A.
Swerdloff, Michael D.: *See*—
Rogic, Milorad M.; Swerdloff, Michael D.; and Demmin, Timothy R., 4,045,422, Cl. 260-143.000.
Swingley, Wayne. Fuel vapor generator. 4,044,741, Cl. 123-122.0AB.
Swodenk, Wolfgang: *See*—
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,045,496, Cl. 260-613.00D.
Swolfs, Henri Samuel: *See*—
Jones, Arfon Harry; Swolfs, Henri Samuel; and Green, Sidney Joseph, 4,044,828, Cl. 166-250.000.
Symosko, Stephen: *See*—
Castelli, Joseph T.; Forrester, Joseph J.; and Symosko, Stephen, 4,045,788, Cl. 340-323.00R.
Syntex Corporation: *See*—
Fried, John H.; and Harrison, Ian T., 4,045,485, Cl. 260-566.00A.
Syntex (U.S.A.) Inc.: *See*—
Walker, Keith A. M., 4,045,568, Cl. 424-273.000.
System Development Corporation: *See*—
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 4,045,814, Cl. 358-124.000.
Syva Company: *See*—
Soffer, Michael J.; and Schneider, Richard S., 4,045,420, Cl. 260-112.00R.
Szabo, Anthony W.; and Del Guercio, Louis R. M. Fluid infusion apparatus. 4,044,764, Cl. 128-214.00F.
Sze, Morgan C.: *See*—
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 4,045,504, Cl. 260-669.00R.
Szeberenyi, Szabolcs: *See*—
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.
Szecsi, Peter L.: *See*—
Onsager, Olav T.; and Szecsi, Peter L., 4,045,500, Cl. 260-635.00H.
Szporny, Laszlo: *See*—
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.
Tabata, Katsuhiro: *See*—
Shimizu, Tsuyoshi; and Tabata, Katsuhiro, 4,044,984, Cl. 249-95.000.
Tabuchi, Katumi: *See*—
Kaname, Yuichi; Nakajima, Masaya; and Tabuchi, Katumi, 4,044,611, Cl. 73-170.00A.
Tachibana, Kyozo, to Hitachi, Ltd. Power converter system. 4,045,722, Cl. 363-126.000.

Tachikawa, Shiro: *See*—
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.
Taimei Kinzoku Kabushiki Kaisha: *See*—
Kubota, Yasuna, 4,044,995, Cl. 251-188.000.
Tajima, Eiichi; and Yamamoto, Kaname, to Tajima Roofing Co., Ltd. Combined application process of thermal insulation and built-up roofing or waterproofing. 4,045,265, Cl. 156-71.000.
Tajima Roofing Co., Ltd.: *See*—
Tajima, Eiichi; and Yamamoto, Kaname, 4,045,265, Cl. 156-71.000.
Takada, Isao: *See*—
Suzuki, Hiroo; and Takada, Isao, 4,045,399, Cl. 260-29.60N.
Takahashi, Kenryu. Spreadable anchor assembly. 4,044,647, Cl. 85-72.000.
Takahashi, Toshio: *See*—
Takahata, Fumio; Takahashi, Toshio; and Hirata, Yasuo, 4,045,614, Cl. 178-69.100.
Takahata, Fumio; Takahashi, Toshio; and Hirata, Yasuo, to Kokusai Denshin Denwa Kabushiki Kaisha. System for controlling polarity state of start-stop telegraph signal train. 4,045,614, Cl. 178-69.100.
Takamoku, Hidetoshi: *See*—
Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, 4,045,338, Cl. 210-36.000.
Takamura, Toru: *See*—
Nakatani, Hirokuni; Takamura, Toru; and Hashimoto, Susumu, 4,045,817, Cl. 358-213.000.
Takasawa, Seigo: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.
Takase, Muneaki, to Zenyaku Kogyo Kabushiki Kaisha. Tumbing apparatus. 4,044,713, Cl. 118-19.000.
Takeda, Chikahiro: *See*—
Mitsumori, Nobuo; Takeda, Chikahiro; and Miyasako, Hideichi, 4,045,553, Cl. 424-132.000.
Takeda, Hideomi; and Kikuchi, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus detecting device. 4,045,804, Cl. 354-25.000.
Takeda, Katsuhiko: *See*—
Nagano, Tadashi; Miyao, Saisei; and Takeda, Katsuhiko, 4,045,279, Cl. 162-25.000.
Takeda, Mitsuo: *See*—
Yasutome, Osamu; and Takeda, Mitsuo, 4,045,702, Cl. 313-496.000.
Takeda Riken Kogyo Kabushikikaisha: *See*—
Tokunou, Takashi; Kouya, Shinichi; and Akatsuka, Shigeki, 4,045,731, Cl. 324-78.00F.
Takenaka, Toichi: *See*—
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.
Takeshima, Masaki: *See*—
Hirano, Mikio; Takeshima, Masaki; Saito, Toru; and Shimozato, Atou, 4,045,539, Cl. 423-240.000.
Taketa, Jun A. Method and apparatus for refacing an abrasive wheel. 4,044,506, Cl. 51-5.00D.
Taller, Robert Arthur; and Elder, Decker Kuykendall, to Union Carbide Corporation. Low viscosity poly(epoxide-caprolactone) polyols. 4,045,474, Cl. 260-484.00A.
Tam, Richard K. W., to Burroughs Corporation. High speed differential to TTL converter. 4,045,690, Cl. 307-260.000.
Tamura, Tsutomu: *See*—
Akagawa, Masatake; and Tamura, Tsutomu, 4,045,659, Cl. 235-151.300.
Tanaka, Isao: *See*—
Tsuruta, Hidemasa; Kinoshita, Yoshiaki; and Tanaka, Isao, 4,045,341, Cl. 210-45.000.
Tang, Raymond; and Wong, Nam San, to Hughes Aircraft Company. Phase steered subarray antenna. 4,045,800, Cl. 343-854.000.
Taniguchi, Motoaki; and Iwata, Toyomi, to Bridgestone Tire Company Limited. Pneumatic tire for airplanes. 4,044,810, Cl. 152-209.00R.
Tapp, David J.: *See*—
Schuessler, John C.; and Tapp, David J., 4,045,751, Cl. 335-201.000.
Tardy, Maurice; and Paulet, Jean, to Bennes Marrel. Selective and proportional hydraulic remote control device, in particular for handling and public work gears. 4,044,795, Cl. 137-625.600.
Tartter, Arnold, to BASF Aktiengesellschaft. Salt of a sulfonic acid substituted 1:2 metal complex dye with a basic dye and an amine. 4,045,424, Cl. 260-147.000.
Tasdemiroglu, Server: *See*—
Pagano, Victor H.; and Tasdemiroglu, Server, 4,044,679, Cl. 102-52.000.
Tasset, Francis: *See*—
Deportes, Charles Henri; Henault, Marc Patrice Sylvain; Tasset, Francis; and Vitter, Gerard Raymond Robert, 4,045,319, Cl. 204-195.00S.
Tate, Mark T.: *See*—
Booher, Howard, 4,044,899, Cl. 214-82.000.
Tateno, Hidenori; Yoshida, Toshiro; and Hirasawa, Koichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for controlling a choke valve in a carburetor. 4,044,736, Cl. 123-119.00F.
Tausanovitch, Dusan; Lovisa, Peter R.; and Lovisa, Tullio E. Externally controlled spreader system. 4,044,987, Cl. 249-219.00W.
Taylor, Gary Burton; and Eberhardt, Roland C. Skateboard wheel assembly. 4,045,046, Cl. 280-87.04A.
Taylor, Ralph Charles: *See*—
Weisgerber, William Robert; and Taylor, Ralph Charles, 4,045,660, Cl. 235-151.110.
Teach, Eugene G.: *See*—
Lam, Hsiao-ling; and Teach, Eugene G., 4,045,557, Cl. 424-200.000.
Teche, Andre: *See*—
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,045,209, Cl. 71-98.000.
Teijin Limited: *See*—
Ikeda, Morio, 4,044,541, Cl. 57-157.0TS.
Teijin Seiki Company Limited: *See*—
Hoshide, Itsuo, 4,044,538, Cl. 57-62.000.
Telectro-Mek, Inc.: *See*—
Russ, Daniel G., 4,044,604, Cl. 73-61.00R.
Russ, Daniel G., 4,045,139, Cl. 356-36.000.
Teletype Corporation: *See*—
Jones, Robert K.; and Sue, Harry, 4,045,310, Cl. 204-129.400.
Temple, Fred, to Westinghouse Air Brake Company. Emergency portion for brake control valve. 4,045,095, Cl. 303-37.000.
Terra Tek, Inc.: *See*—
Jones, Arfon Harry; Swolfs, Henri Samuel; and Green, Sidney Joseph, 4,044,828, Cl. 166-250.000.
Tesei, Renato: *See*—
Romano, Ugo; and Tesei, Renato, 4,045,464, Cl. 260-463.000.
Texaco Inc.: *See*—
Allen, Joseph C., 4,044,831, Cl. 166-275.000.
Dille, Roger M.; Van Stavern, Merle H.; Shull, Don L.; and Gripshover, David F., 4,045,671, Cl. 250-341.000.
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,044,602, Cl. 73-59.000.
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,044,603, Cl. 73-59.000.
Rubin, Isaac D.; and Nebzydoski, John W., 4,045,376, Cl. 252-56.00S.
Texas Instruments Incorporated: *See*—
Dix, Robert M.; Tobias, Samuel F.; and Whicker, Stephen L., 4,044,567, Cl. 62-6.000.
Textron Inc.: *See*—
Moertel, George B., 4,044,431, Cl. 24-205.13C.
Tezuka, Junichi, to Electroplating Engineers of Japan, Ltd. High speed nickel plating method using insoluble anode. 4,045,304, Cl. 204-49.000.
Thein, San: *See*—
Henze, Walter J.; and Thein, San, 4,044,489, Cl. 43-27.400.
Thomas, Everett A.; and Knake, Ronald W., to N L Industries, Inc. Refractory composition and method for preparation. 4,045,233, Cl. 106-57.000.
Thomas, Lewis P. Golf club weighted attachment. 4,045,034, Cl. 273-194.00B.
Thome, Paul. Fluid tight movable passage. 4,045,647, Cl. 219-121.0EB.
Thompson, Robert M.; and Nickol, Stephen L., to Suntech, Inc. Melt blending polyamide process. 4,045,512, Cl. 260-857.0TW.
Thomson-Brandt: *See*—
Phan, Chi Quy, 4,044,449, Cl. 29-460.000.
Thomson-CSF. *See*—
Carre, Roland, 4,045,798, Cl. 343-17.2PC.
de Corlieu, Guy; and Reymond, Jean-Claude, 4,045,120, Cl. 350-96.00C.
Le Cardonnel, Gerard; Gravez, Pierre; and Favre, Rene Marc, 4,045,622, Cl. 179-175.20C.
Moutou, Paul Cyril, 4,045,252, Cl. 148-1.500.
Thomson, Walter Grey: *See*—
Hill, Thomas; Kennedy, Ambrose; and Thomson, Walter Grey, 4,044,937, Cl. 225-97.000.
Tietjens, Eduard Willem, to U.S. Philips Corporation. Shaving apparatus with a holder for a cutting element. 4,044,463, Cl. 30-34.200.
Tietz, Gary W., to National Semiconductor Corporation. Circuit for squaring the transfer characteristics of a TTL gate. 4,045,689, Cl. 307-254.000.
Tii Corporation: *See*—
Armstrong, Edward T., 4,045,347, Cl. 210-199.000.
Time Data Corporation: *See*—
Sloane, Edwin A., 4,045,616, Cl. 179-1.0SA.
Titov, Dmitry Vladimirovich; Komarov, Jury Ivanovich; Butuzov, Alexei Vasilievich; and Farzaliev, Mazakhir Gamza Ogly. Weft thread beat-up mechanism for travelling wave shedding looms. 4,044,801, Cl. 139-436.000.
Tobback, Hubert: *See*—
Wens, Karel; Tobback, Hubert; and Hens, Karel, 4,045,301, Cl. 204-12.000.
Tobias, Samuel F.: *See*—
Dix, Robert M.; Tobias, Samuel F.; and Whicker, Stephen L., 4,044,567, Cl. 62-6.000.
Tobita, Tutomu: *See*—
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, 4,045,526, Cl. 264-.500.
Toda, Hiroyuki; Otomegawa, Eiichi; Aoyama, Toshimi; and Nakane, Hisashi, to Tokyo Ohka Kogyo Kabushiki Kaisha. Photosensitive resin composition for flexographic printing plates. 4,045,231, Cl. 96-115.00P.
Todd, Robert A. Friction facing with porous sheet base. 4,045,608, Cl. 428-251.000.
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, to Toray Industries, Inc. Elastomer coated carbon filament

reinforcing yarn or cord, method and article. 4,044,540, Cl. 57-153.000.
Tokico Ltd.: *See—*
Ishida, Kunio, 4,044,866, Cl. 188-322.000.
Karasudani, Yasuo, 4,044,864, Cl. 188-73.300.
Toko, Inc.: *See—*
Arakawa, Koji, 4,045,753, Cl. 333-72.000.
Tokorozawa Electronic Corporation: *See—*
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,045,695, Cl. 310-322.000.
Tokuno, Masateru, to Rengo Co., Ltd. Goods discharging apparatus. 4,044,901, Cl. 214-89.000.
Tokunou, Takashi; Kouya, Shinichi; and Akatsuka, Shigeki, to Takeda Riken Kogyo Kabushikikaisha. Filter having an automatically controlled variable cut-off frequency. 4,045,731, Cl. 324-78.00F.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See—*
Toda, Hiroyuki; Otomegawa, Eiichi; Aoyama, Toshimi; and Nakane, Hisashi, 4,045,231, Cl. 96-115.00P.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ichinose, Noboru; Yokomizo, Yuji; and Katsura, Masaki, 4,045,764, Cl. 338-34.000.
Mori, Yasamasu; Ashiuchi, Kenzo; Yasytome, Osamu; and Sawamura, Tagayasu, 4,045,703, Cl. 313-497.000.
Yasutome, Osamu; and Takeda, Mitsuo, 4,045,702, Cl. 313-496.000.
Tolasch, Gerhard: *See—*
Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, 4,044,659, Cl. 93-77.0FT.
Toler, Jacob A. Whirl toy. 4,044,499, Cl. 46-228.000.
Tomasky, Thomas: *See—*
Arnold, Robert Walker; and Tomasky, Thomas, 4,045,770, Cl. 346-75.000.
Tomlinson Industries, Inc.: *See—*
Giese, Elroy J., deceased, 4,044,998, Cl. 251-331.000.
Topar Products Corporation: *See—*
Parkinson, Harold B., 4,045,232, Cl. 106-28.000.
Toray Industries, Inc.: *See—*
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, 4,044,540, Cl. 57-153.000.
Tordenmalm, Osten Lars: *See—*
Oldaeus, Karl Olof; Tordenmalm, Osten Lars; and Nilsson, Bo Nils, 4,044,610, Cl. 73-133.00R.
Torgerson, Duane E., to Belden Corporation. Hermetic lead wire. 4,045,611, Cl. 174-121.0SR.
Torstenfelt, Ragnar: *See—*
Andersson, Lars; Rehn, Johnny; and Torstenfelt, Ragnar, 4,045,099, Cl. 308-36.000.
Tourunen, Pekka Tapio, to AB Mecman. Hydraulic shock absorber. 4,044,865, Cl. 188-287.000.
Tower Manufacturing Corporation: *See—*
Mongeau, Roland E., 4,045,637, Cl. 200-303.000.
Townsend, Raymond. Occupant-propelled round about. 4,045,020, Cl. 272-33.00R.
Toyo Boseki Kabushiki Kaisha: *See—*
Isaka, Tsutomu; Inoue, Shuji; and Arakawa, Kunihiko, 4,045,515, Cl. 260-897.00A.
Katori, Kunihiko; Nagai, Hiroshi, and Shiiki, Zenya, 4,045,368, Cl. 252-421.000.
Toyo Ink Mfg. Co., Ltd.: *See—*
Suzuki, Hiroo; and Takada, Isao, 4,045,399, Cl. 260-29.60N.
Toyo Pulp Co., Ltd.: *See—*
Nagano, Tadashi; Miyao, Saisei; and Takeda, Katsuhiko, 4,045,279, Cl. 162-25.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, 4,045,353, Cl. 210-502.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kuramochi, Koujirou; and Ohnuma, Kiyoshi, 4,044,556, Cl. 60-361.000.
Masaaki, Noguchi; Yukiyasu, Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, 4,044,730, Cl. 123-75.00B.
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, 4,044,739, Cl. 123-119.00A.
Nishimura, Satomu, 4,044,737, Cl. 123-119.00A.
Ohta, Jun, 4,045,794, Cl. 340-414.000.
Sumiyoshi, Masaharu, 4,044,735, Cl. 123-119.00A.
Tateno, Hidenori; Yoshida, Toshiro; and Hirasawa, Koichi, 4,044,736, Cl. 123-119.00F.
Treber, Norbert: *See—*
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,045,198, Cl. 65-33.000.
Treheux, Daniel: *See—*
Guiraldenq, Pierre; Treheux, Daniel; and Marchive, Daniel, 4,045,596, Cl. 427-229.000.
Trevillyan, Alvin E., to Standard Oil Company (Indiana). Hydroformylation of olefins. 4,045,493, Cl. 260-604.0HF.
Trio Kabushiki Kaisha: *See—*
Goto, Tadaaki, 4,045,713, Cl. 315-391.000.
Tritsch, Ludwig, to Johnson & Johnson. Tab fastener having two tape segments attached to each other and to diaper. 4,044,767, Cl. 128-287.000.
Trivedi, Bhupendra C.: *See—*
Richards, Harvey J.; and Trivedi, Bhupendra C., 4,045,441, Cl. 260-289.0XA.
Trotter, Gerald F.: *See—*
Marchello, John L.; and Trotter, Gerald F., 4,044,531, Cl. 54-80.000.
Troy, Michael, to Raychem Corporation. Splice case housing. 4,045,612, Cl. 174-136.000.
Trumbull, Harold E.; and Poeth, Dean F., to Battelle Memorial Institute. Method of feeding particles from a first region to a second region. 4,044,904, Cl. 214-152.000.
Tsai, Chin-Chin. Distributor. 4,045,625, Cl. 200-24.000.
Tsai, Yih-Wan; Sensi, John E.; and Henry, Vincent I., to PPG Industries, Inc. Glassmaking furnace employing heat pipes for preheating glass batch. 4,045,197, Cl. 65-27.000.
Tsuboi, Masayoshi: *See—*
Shinozaki, Fumiaki; Ikeda, Tomoaki; and Tsuboi, Masayoshi, 4,045,222, Cl. 96-33.000.
Tsuji, Akio: *See—*
Fujisawa, Kenzo; Sakaedani, Yoshiyasu; and Tsuji, Akio, 4,044,475, Cl. 35-6.000.
Tsuji, Kozo: *See—*
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.
Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, 4,045,388, Cl. 260-17.4ST.
Tsunoda, Atsuo: *See—*
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.
Tsuruta, Hidemasa; Kinoshita, Yoshiaki; and Tanaka, Isao, to Nittetu Chemical Engineering Ltd. Method for the disposal of waste water containing ammonium ions, sulfate ions and organic substances. 4,045,341, Cl. 210-45.000.
Tucker, Dalton R. Clamp assembly with guide means for removing selected arc length of clamped ring for size reduction. 4,044,413, Cl. 7-3.00R.
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Turbo Refrigerating Company: *See—*
Hagen, William F., 4,044,568, Cl. 62-73.000.
Turko, William Melvin: *See—*
Chiu, Shui-Tung; and Turko, William Melvin, 4,045,595, Cl. 427-202.000.
Turley, Bernard C., to Aluminum Company of America. Structure for switching electrical current and cell comprising same. 4,045,307, Cl. 204-64.000.
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Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno, 4,044,962, Cl. 242-47.050.
Tzakis, George J.: *See—*
Meehan, David H.; and Tzakis, George J., 4,045,742, Cl. 328-9.000.
Ube Industries, Ltd.: *See—*
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Adachi, Fumio, 4,045,478, Cl. 260-530.00N.
Ueda, Satoshi: *See—*
Igarashi, Jun; Koga, Tadao; and Ueda, Satoshi, 4,045,051, Cl. 280-644.000.
Uemura, Masaru: *See—*
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, 4,045,353, Cl. 210-502.000.
Ueno, Kiyoshi, to NHK Spring Co., Ltd. Reclining chair. 4,045,081, Cl. 297-317.000.
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, to Ogawa & Co., Ltd. Sublimable aromatic compositions. 4,045,551, Cl. 424-76.000.
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Romagnolo, Gerard, 4,044,439, Cl. 29-95.00R.
Ullmann, Werner; Ferroni, Bernardo; and Levy, Gideon N., to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Control system for an electro-erosion machine tool. 4,045,641, Cl. 219-69.00C.
Ulrich, Lawrence Walter; and Walker, Connie Wayne, to Durable Packaging Corporation. Apparatus for sealing containers. 4,044,527, Cl. 53-137.000.
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Umpleby, Kenneth F.; and Brackney, Maurice R., to Multi-Elmac Company. Operator motor control. 4,045,715, Cl. 318-16.000.
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Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.
Union Camp Corporation: *See—*
Mitchard, John M., 4,044,658, Cl. 93-49.00R.
Union Carbide Corporation: *See—*
Hess, Lawrence George, 4,045,394, Cl. 260-23.0AR.
Hill, David C.; and Flanigen, Edith M., 4,045,593, Cl. 427-59.000.
Kupcikevicius, Vytautas; and Mika, Anton LeRoy, 4,044,426, Cl. 17-49.000.
Martin, Jay Robert, 4,045,191, Cl. 55-179.000.
Nausedas, Joseph Anthony, 4,044,425, Cl. 17-35.000.
Prokai, Bela; and Kanner, Bernard, 4,045,381, Cl. 260-2.5AH.
Raudys, Vytas Andrew; and DeVitto, Ronald Robert, 4,044,450, Cl. 29-509.000.

Robson, John Howard; and Marcus, Erich, 4,045,416, Cl. 260-77.5CR.
Taller, Robert Arthur; and Elder, Decker Kuykendall, 4,045,474, Cl. 260-484.00A.
Young, Robert Hayward; and Matzner, Markus, 4,045,180, Cl. 23-260.000.

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Fischer, Paul W.; and Scheffel, John W., 4,045,360, Cl. 252-8.300.
Ward, John W., 4,045,331, Cl. 208-213.000.

Uniroyal, Inc.: *See—*
Habert, William C.; and Jawanda, Jasjit S., 4,045,277, Cl. 156-417.000.
Malz, Russell E., Jr.; Amidon, Roger W.; and Greenfield, Harold, 4,045,484, Cl. 260-561.00H.

Uniroyal Luxembourg S.A.: *See—*
Goerens, Robert L., 4,044,539, Cl. 57-125.000.

United Kingdom Atomic Energy Authority: *See—*
Green, Derek; Pardoe, John Alan; and Etherington, Clifford, 4,044,587, Cl. 72-261.000.

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Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry Nash, 4,045,237, Cl. 106-89.000.

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Jacks, Roy T., 4,044,628, Cl. 74-574.000.

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Agriculture: *See—*
Fanta, George F.; and Doane, William M., 4,045,387, Cl. 260-17.4GC.
Rowland, Stanley P., 4,045,173, Cl. 8-116.00P.
Springer, Edward L., 4,045,554, Cl. 424-164.000.

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Arnold, Fred E.; and Hedberg, Frederick L., 4,045,409, Cl. 260-49.000.

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Baker, Kenneth L., 4,045,740, Cl. 325-427.000.
F'Geppert, Erwin, 4,044,620, Cl. 74-190.000.
Pagano, Victor H.; and Tasdemiroglu, Server, 4,044,679, Cl. 102-52.000.
Singer, Abraham; and Minkowski, Jan M., 4,045,730, Cl. 324-76.00R.

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Barak, Amitzur Z., 4,044,752, Cl. 126-270.000.
Cottingham, James G., 4,044,819, Cl. 165-1.000.
Larsen, Robert P., 4,045,673, Cl. 250-364.000.
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.
Shuck, Lowell Z.; Fasching, George E.; and Balanis, Constantine A., 4,045,724, Cl. 324-6.000.
Strauss, Bruce P.; Reardon, Paul J.; and Remsbottom, Robert H., 4,044,457, Cl. 29-599.000.

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Griffith, James M.; and Henry, Walter L., 4,045,815, Cl. 358-183.000.
McCarthy, Charles J.; Charles, Steven; and Eichenbaum, Daniel M., 4,045,630, Cl. 200-52.00R.
Rapoport, Henry; and Barber, Randy B., 4,045,440, Cl. 260-285.000.

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Appleberry, Walter Thomas. Load regulating latch. 4,045,063, Cl. 292-110.000.
Arens, Wayne E. Charge-coupled device data processor for an airborne imaging radar system. 4,045,795, Cl. 343-5.0CM.
Kolbly, Richard B. Direct reading inductance meter. 4,045,728, Cl. 324-59.000.
Miller, Charles G. Low to high temperature energy conversion system. 4,044,821, Cl. 165-2.000.
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Saffren, Melvin M. Apparatus for photon excited catalysis. 4,045,359, Cl. 250-527.000.
Selcuk, M. Kudret. Solar energy collection system. 4,044,753, Cl. 126-271.000.

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Jackson, Melvin R., 4,045,255, Cl. 148-32.000.
Morris, James F., 4,045,247, Cl. 136-240.000.
Ravenhall, Richard, 4,045,149, Cl. 416-135.000.
Schaefer, David H.; and Strong, James P., III, 4,045,792, Cl. 340-347.0AD.

Navy: *See—*
Baczuk, Robert J., 4,045,261, Cl. 149-19.800.
Bumgardner, Jon H., 4,045,140, Cl. 356-141.000.
Feldman, Harold P., 4,044,863, Cl. 188-65.100.
Goldstein, David; Pless, William C.; Shapiro, Michael; Spencer, Dana; and Starr, Leland E., Jr., 4,044,599, Cl. 73-12.000.
Griffith, James R.; and O'Rear, Jacques G., 4,045,408, Cl. 260-47.0EA.
Stavovy, Alexander B.; and Chiu, Richard H., 4,044,598, Cl. 73-7.000.

U.S. Philips Corporation: *See—*
Bakel, Adrianus Maria Van; and Fransen, Jan Josephus Bernardus, 4,045,367, Cl. 252-181.400.
Barten, Piet Gerard Joseph, 4,045,754, Cl. 335-212.000.
Berger, Erich, 4,044,868, Cl. 192-12.00B.
Bos, Jules; and von der Kall, Gunter, 4,044,509, Cl. 51-206.00P.
Dapiran, Fulvio, 4,045,799, Cl. 343-113.0PT.
Hargreaves, Clifford McDonald, 4,044,911, Cl. 220-9.0LG.
Kunath, Helfrid, 4,044,878, Cl. 197-1.00R.
Shannon, John Martin; and Beale, Julian Robert Anthony, 4,045,248, Cl. 148-1.500.
Tietjens, Eduard Willem, 4,044,463, Cl. 30-34.200.
Verhoeven, Leonardus Adrianus Johannes; De Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, 4,045,812, Cl. 358-4.000.
Vrenken, Louis Eugene; and Broerse, Pieter Hendrik, 4,045,664, Cl. 240-46.030.

United Technology, Inc.: *See—*
Brown, Frank J., 4,045,072, Cl. 294-74.000.

University of Southern California, The: *See—*
Yen, Teh Fu; and Wen, Chaur-Shyong, 4,045,313, Cl. 204-131.000.

Upjohn Company, The: *See—*
Bundy, Gordon L., 4,045,449, Cl. 260-340.200.

Urai, Muneharu; Kogure, Koji; and Haraguchi, Youichiro, to Saitoi, Takeji. Apparatus for manufacturing cushion materials. 4,044,715, Cl. 118-50.000.

Urmanov, Urman Alexandrov, to DSO "Stara Planina". Method for making laminated particleboard of oriented wood particles. 4,045,528, Cl. 264-69.000.

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Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.

USM Corporation: *See—*
Powderley, John, 4,044,591, Cl. 72-391.000.

Utamura, Yukihiko: *See—*
Kishino, Takao; and Utamura, Yukihiko, 4,045,704, Cl. 313-497.000.

Utex Industries, Inc.: *See—*
Pippert, Aaron J., 4,045,037, Cl. 277-205.000.

Uyeda, Roy Teruyuki, to E. I. Du Ponte de Nemours and Company. Antidepressant 1,1a,6,10b-tetrahydrodibenzo[a,e]cyclopropa[c]-cyclohepten-6-substituted oximes. 4,045,432, Cl. 260-239.00B.

Valbert, Jon R.: *See—*
Becker, Mitchell; and Valbert, Jon R., 4,045,294, Cl. 203-69.000.

Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, to AGFA-GEVAERT N.V. Direct positive emulsions containing fogged, monodispersed silver halide grains having more than 10 mile % iodide. 4,045,228, Cl. 96-64.000.

Van Brakel, Russel A., to Haverberg Auto Laundry Equipment Co. Inc. Reduced length vehicle conveyor. 4,044,686, Cl. 104-172.00B.

van der Heem, Peter: *See—*
Wason, Satish K.; and van der Heem, Peter, 4,045,240, Cl. 106-288.00B.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N. V. Soil cultivating machines. 4,044,840, Cl. 172-59.000.

van der Lely, Cornelis. Soil cultivating machines. 4,044,839, Cl. 172-49.000.

Vandervell Products Limited: *See—*
Waimsley, Robert Edwin; Oliver, Robert; and Fisher, Norman Ernest, 4,044,589, Cl. 72-341.000.

Van Holten, James Wilbur. Gun sight mounting. 4,044,486, Cl. 42-1.0ST.

Van Huisen, Allen T. Multiple-completion geothermal energy production systems. 4,044,830, Cl. 166-267.000.

van Santen, Aart, to Aktiebolaget ASEA-ATOM. Fuel assembly with easily detachable components. 4,045,287, Cl. 176-78.000.

Van Stavern, Merle H.: *See—*
Dille, Roger M.; Van Stavern, Merle H.; Shull, Don L.; and Gripshover, David F., 4,045,671, Cl. 250-341.000.

Varga, William J., to Chase Brass & Copper Co., Incorporated. Continuous casting method using graphite mold impregnated with unsaturated drying oil. 4,044,817, Cl. 164-138.000.

Varian Associates, Inc.: *See—*
Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 4,045,343, Cl. 210-101.000.
Ernst, Richard R., 4,045,723, Cl. 324-.50A.
Wheeler, William R., 4,044,993, Cl. 251-158.000.

Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, to Cor Tech Research Limited. Mobile room-temperature stable acid catalyzed phenol formaldehyde resin compositions. 4,045,411, Cl. 260-59.00R.

Vaught, John M., to General Motors Corporation. Variable geometry swirler. 4,044,553, Cl. 60-39.230.

VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
Opletal, Josef, 4,044,884, Cl. 198-415.000.

Vella, James. Closure element for a container. 4,044,917, Cl. 220-288.000.

Velsicol Chemical Corporation: *See—*
Anderson, Arnold L., 4,045,405, Cl. 260-45.75R.
Anderson, Arnold L., 4,045,406, Cl. 260-45.75R.
Wu, Chin Ching; and Krenzer, John, 4,045,446, Cl. 260-294.80C.

Ventre, Edmond: *See—*
Blum, Jacques Marcel; Grenon, Michel; and Ventre, Edmond, 4,045,286, Cl. 176-49.000.

Verhoeven, Leonardus Adrianus Johannes; De Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, to U.S. Philips Corporation. Color television recording system employing frequency modulation and pulse width modulation. 4,045,812, Cl. 358-4.000.

Vering, Antonius: *See*—
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, 4,045,161, Cl. 432-80.000.
Vermeulen, Leon Ampeir. Diamonds. 4,045,674, Cl. 250-370.000.
Vermilye, Michael Lee, to Boeing Company, The. Turbine wheel containment shroud for a pneumatically powered turbine engine starter motor. 4,044,550, Cl. 60-39.09R.
Vernaleken, Hugo: *See*—
Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, 4,045,382, Cl. 260-4.00R.
Vernon, John T.: *See*—
Ankrom, Albert M.; and Vernon, John T., 4,044,427, Cl. 19-97.000.
Vetten, Wilhelm, to Jagenberg Werke AG. Device for the pre-folding of the closure of a folding box. 4,044,656, Cl. 93-44.1GT.
Victor Company of Japan, Ltd.: *See*—
Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, 4,045,621, Cl. 179-100.4ST.
Vigliecca, Lucien: *See*—
Azemar, Michel; and Vigliecca, Lucien, 4,045,185, Cl. 23-290.000.
Vikre, Lauritz, to Sverre Munck A/S. Maintenance device for use underneath deck structures. 4,044,858, Cl. 182-82.000.
Villanueva, Eliseo Herrando. Continuous cutting machine for stone and building materials. 4,044,748, Cl. 125-13.00R.
Vinogradov, Alexandr Vasilievich: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Vinogradova, Olga Vladimirovna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
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Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Vinot, Daniel Rene: *See*—
Antoine, Pierre Gabriel; Cassonnet, Jean-Claude Marcel; and Vinot, Daniel Rene, 4,045,661, Cl. 235-153.0AC.
Vitter, Gerard Raymond Robert: *See*—
Deportes, Charles Henri; Henault, Marc Patrice Sylvain; Tasset, Francis; and Vitter, Gerard Raymond Robert, 4,045,319, Cl. 204-195.00S.
Vogel, Axel, to Bayer Aktiengesellschaft. Process for separating 1,5-dinitroanthraquinone and 1,8-dinitroanthraquinone from dinitroanthraquinone mixtures. 4,045,455, Cl. 260-369.000.
Vogel, John D., to McCord Corporation. Cage for flailing tube. 4,044,953, Cl. 239-229.000.
Vogelman, Joseph: *See*—
Orentreich, Seymour; and Vogelman, Joseph, 4,044,889, Cl. 206-459.000.
Volz, Herbert A., to Phillips Petroleum Company. Acid foam fracturing. 4,044,833, Cl. 166-307.000.
von der Kall, Gunter: *See*—
Bos, Jules; and von der Kall, Gunter, 4,044,509, Cl. 51-206.00P.
von Strandtmann, Maximilian: *See*—
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Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,563, Cl. 424-263.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,564, Cl. 424-263.000.
Vorbach, Guenther; and Kuballa, Siegfried, to Siemens Aktiengesellschaft. Method for the production of a diode matrix for character generators. 4,044,453, Cl. 29-574.000.
Vorobiev, Vladimir Dmitrievich: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Voss, David Lehmann; Miller, William Albert; and Hermansen, Ralph David, to Sierracin Corporation: Transparent formable polyurethane polycarbonate lamination. 4,045,269, Cl. 156-221.000.
Voss, Gunter: *See*—
Senge, Gerd; and Voss, Gunter, 4,045,306, Cl. 204-55.00R.
Vrenken, Louis Eugene; and Broerse, Pieter Hendrik, to U.S. Philips Corporation. Lighting fitting provided with at least two-low-pressure mercury vapor discharge lamps. 4,045,664, Cl. 240-46.030.
W. R. Grace & Co.: *See*—
Guthrie, James Leverette; and Kehr, Clifton Leroy, 4,045,472, Cl. 260-471.00C.
Larsen, Donald W., 4,045,317, Cl. 204-159.230.
Marans, Nelson Samuel; and Gluecksmann, Alfred, 4,045,396, Cl. 260-29.2TN.
Morgan, Charles R., 4,045,516, Cl. 260-886.000.
Warthen, John Lawrence; Briggs, Warren Stanley; and Paggen, Marvin Vernon, 4,045,372, Cl. 252-463.000.
Wolfe, Court Lone; and Krutz, Ronald Louis, 4,045,679, Cl. 250-461.00R.
Wachtel, Helmut: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.
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Wade, Robert J. Combination animal toy and container. 4,045,019, Cl. 272-1.00A.
Wagner Electric Corporation: *See*—
Atkins, Carl E.; and McGuirk, Francis A., Jr., 4,045,778, Cl. 340-171.0PF.
Wagner, Robert W. Locking safety pin and key carrier. 4,044,429, Cl. 24-156.000.
Wagner, William E.: *See*—
Amsler, David C.; and Wagner, William E., 4,044,909, Cl. 220-3.800.
Waimsley, Robert Edwin; Oliver, Robert; and Fisher, Norman Ernest, to Vandervell Products Limited. Rotary piston machines. 4,044,589, Cl. 72-341.000.
Waite, John J., to Allis-Chalmers Corporation. Spray tubing within a rotating drum supported independently of the drum. 4,044,951, Cl. 239-1.000.
Wakahata, Yasuo: *See*—
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, 4,045,374, Cl. 252-517.000.
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Wald, Milton M.: *See*—
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Waldmann, Helmut: *See*—
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Walker, Connie Wayne: *See*—
Ulrich, Lawrence Walter; and Walker, Connie Wayne, 4,044,527, Cl. 53-137.000.
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Walker, Ian Clive, to Micro Consultants, Limited. Digital storage systems. 4,045,613, Cl. 178-69.100.
Walker, Keith A. M., to Syntex (U.S.A.) Inc. Derivatives of substituted N-alkyl imidazoles. 4,045,568, Cl. 424-273.000.
Walker, Keith Francis, to Data Recording Instrument Company Limited. Detector circuits. 4,045,743, Cl. 328-150.000.
Walker Magnetics Group, Inc.: *See*—
McDonald, Donald C.; Ela, Roger B.; and Whittaker, Francis E., 4,044,894, Cl. 214-1.0QD.
Wallace, John F., to PPG Industries, Inc. Method of casting bismuth, silicon and silicon alloys. 4,045,536, Cl. 264-327.000.
Wallace Murray Corporation: *See*—
Pope, James W.; and Overpeck, Max E., 4,045,039, Cl. 279-123.000.
Waller, Henry A., to Consolidated Controls Corporation. High energy loss fluid flow control device. 4,044,991, Cl. 251-122.000.
Wallin, Jan-Olof, to Granges Essem Aktiebolag. Locking mechanism for vehicle safety belts. 4,044,969, Cl. 242-107.40A.
Wallis, Bernard J. Lubricating means for gas-operated cylinders. 4,044,859, Cl. 184-18.000.
Walter, Josef, to J. Walter AG. Traveling undercarriage for a container or the like. 4,045,042, Cl. 280-79.10R.
Walter Kidde & Company, Inc.: *See*—
Greenwald, Harry; and Iglio, Salvatore, 4,044,875, Cl. 194-1.00K.
Wannag, Arne T. Forceps made in one piece. 4,044,771, Cl. 128-354.000.
Ward, John W., to Union Oil Company of California. Demetallization and desulfurization of petroleum feed-stocks with manganese on alumina catalysts. 4,045,331, Cl. 208-213.000.
Ward, Richard L.: *See*—
Battista, Orlando A.; and Ward, Richard L., 4,045,238, Cl. 106-122.000.
Ward, Roderick K.: *See*—
Carrieri, Louis F.; Brownell, James R.; Helrigel, Robert A.; Ward, Roderick K.; and Wroblewski, Jerome J., 4,044,592, Cl. 72-462.000.

Warder, Ira T., Jr.: *See*—
Douros, John D., Jr.; and Warder, Ira T., Jr., 4,045,582, Cl. 426-69.000.

Warner-Lambert Company: *See*—
Connor, David T.; and von Strandtmann, Maximilian, 4,045,451, Cl. 260-345.200.
Le Boeuf, Albert R.; and Grovesteen, William R., 4,045,547, Cl. 424-28.000.

Warner & Swasey Company, The: *See*—
Anderson, Terry M.; and Schumann, Reinhard, 4,045,782, Cl. 364-200.000.

Warrick, James C., to Bailey Meter Company. Pneumatic function generator assembly. 4,044,651, Cl. 91-47.000.

Warthen, John Lawrence; Briggs, Warren Stanley; and Paggen, Marvin Vernon, to W. R. Grace & Co. Control of physical properties of alumina extrudates. 4,045,372, Cl. 252-463.000.

Wason, Satish K.; and van der Heem, Peter, to J. M. Huber Corporation. Amorphous precipitated siliceous pigments and methods for their production. 4,045,240, Cl. 106-288.00B.

Wassermann, Eberhard, to Sulzer Bros. (U.K.) Limited. Method for preventing web rewetting. 4,045,281, Cl. 162-214.000.

Wassilieff, Alexander: *See*—
Kuhne, Kurt Anton; and Wassilieff, Alexander, 4,044,665, Cl. 101-21.000.

Watanabe, Eiji, to Nihon Denshi Kabushiki Kaisha. Apparatus for tomography comprising a pin hole for forming a microbeam of X-rays. 4,045,672, Cl. 250-360.000.

Watanabe, Kazuko; and Arai, Mitsuko. Method of assembling articles of furniture. 4,044,448, Cl. 29-433.000.

Watanabe, Kenji. Clothes hanger particularly for skirt, slacks and the like. 4,044,928, Cl. 223-96.000.

Watanabe, Masashi: *See*—
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.

Watanabe, Sakuji, to Nippon Kogaku K.K. Metering device for cameras. 4,045,142, Cl. 356-223.000.

Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Method of making a printing hammer unit. 4,044,455, Cl. 29-592.000.

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Smith, David H.; and Knight, Richard I., 4,045,705, Cl. 315-3.000.

Watson, Charles J.; and Langrehr, Larry L., to Bell & Howell Company. Control system for photographic film printers. 4,045,136, Cl. 355-83.000.

Watson, Gilbert L.: *See*—
Moss, Paul B.; and Watson, Gilbert L., 4,045,649, Cl. 219-143.000.

Watt, David M., Jr.; and Nirschl, Joseph P., to Procter & Gamble Company, The. Fabric conditioning compositions. 4,045,361, Cl. 252-8.800.

Watts, David J.: *See*—
Caffarella, Thomas E.; Radda, George J.; and Watts, David J., 4,045,201, Cl. 65-105.000.

Waymouth, John F.: *See*—
Chu, Gordon P. K.; Shinn, Dennis B.; and Waymouth, John F., 4,045,156, Cl. 431-95.00R.

Weber, John E.: *See*—
Yoder, Alan C.; and Weber, John E., 4,045,636, Cl. 200-292.000.

Weber, Julius: *See*—
Dorsch, Heinz; and Weber, Julius, 4,044,560, Cl. 60-601.000.

Weber, Ragnar. Micro-method of erythrocyte sedimentation. 4,045,175, Cl. 23-230.00B.

Weber, Wayne Woodrow, II; and Heseltine, Donald Warren, to Eastman Kodak Company. Novel UV absorbing compounds and photographic elements containing UV absorbing compounds. 4,045,229, Cl. 96-84.0UV.

Wedemeyer, Karlfried: *See*—
Klein, Alfons; and Wedemeyer, Karlfried, 4,045,499, Cl. 260-621.00R.

Weedon, Gene Clyde: *See*—
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 4,045,534, Cl. 264-237.000.

Weeks, Lloyd E.; Johnson, John H.; and Reents, Margaret J., to Monsanto Company. Triglycerides determination method. 4,045,297, Cl. 195-103.50R.

Wehinger, Egbert: *See*—
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,045,571, Cl. 424-273.00P.

Weigele, Manfred: *See*—
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Weiger, Gunter: *See*—
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Weigle, Dwight Carl, to Procter & Gamble Company, The. Meat analog from agglomerated protein. 4,045,590, Cl. 426-656.000.

Weinke, Robert; and Wiesmeier, Georg, to Siemens Aktiengesellschaft. Apparatus for moving a printer carriage. 4,044,882, Cl. 197-82.000.

Weisgerber, William Robert; and Taylor, Ralph Charles, to Cincinnati Milacron Inc. Method and apparatus for automatically realigning a machine element to a predetermined position after power interruption. 4,045,660, Cl. 235-151.110.

Weldotron Corporation: *See*—
Zelnick, Seymour, 4,044,529, Cl. 53-198.00R.

Welkowsky, Murray S.: *See*—
Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., 4,044,718, Cl. 118-647.000.

Wellauer, Edward J.; and Strommen, John A., to Falk Corporation, The. Serpentine grid flexible coupling. 4,044,572, Cl. 64-15.00B.

Welstead, William J., Jr.; and Moran, Henry W., to A. H. Robins Company, Incorporated. Anti-inflammatory methods using 2-amino-3-(5- and 6-)benzoylphenylacetic acids, esters and metal salts thereof and the compounds. 4,045,576, Cl. 424-309.000.

Wen, Chaur-Shyong: *See*—
Yen, Teh Fu; and Wen, Chaur-Shyong, 4,045,313, Cl. 204-131.000.

Wens, Karel; Tobback, Hubert; and Hens, Karel, to Metallurgie Hoboken-Overpelt. Electrolytic deposition of metals. 4,045,301, Cl. 204-12.000.

Wenzel, Donald E.; and Felicetta, Vincent F., to Georgia-Pacific Corporation. Lignin dispersant. 4,045,421, Cl. 260-124.00R.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Karayannis, Panayotis, 4,044,682, Cl. 102-70.2GA.

West, Gene A., to General Motors Corporation. Gas turbine engine synchronous speed detector. 4,044,552, Cl. 60-39.16S.

West, Gene A., to General Motors Corporation. Gas turbine engine fuel control. 4,044,554, Cl. 60-39.28T.

West Manufacturing & Towing Equipment Inc.: *See*—
Gaumont, Richard J.; Wolfe, Maurice Leonard; and Collins, Robert Lee, 4,044,900, Cl. 214-86.00A.

Westbrook, James E., to Conrac Corporation. Digital tone detector. 4,045,620, Cl. 179-84.0VF.

Westfalia Separator AG: *See*—
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Westinghouse Air Brake Company: *See*—
Bridigum, Robert J., 4,045,093, Cl. 303-3.000.
Temple, Fred, 4,045,095, Cl. 303-37.000.

Westvaco Corporation: *See*—
Obenshain, David Noel, 4,045,038, Cl. 279-2.00R.

Wetzel, Rolf; and Radke, Dietrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for producing steel. 4,045,214, Cl. 75-60.000.

Wetzel, Thomas Andrew: *See*—
Luedders, Wilmer Louis; and Wetzel, Thomas Andrew, 4,045,548, Cl. 424-47.000.

Wham-O Mfg. Co.: *See*—
Gillespie, Richard Lee; and Melin, Arthur Kelso, 4,045,026, Cl. 273-96.00R.

Wheatley, Carl Franklin, Jr., to RCA Corporation. Adjustable gain current amplifiers. 4,045,746, Cl. 330-23.000.

Wheeler, William R., to Varian Associates, Inc. High vacuum gate valve. 4,044,993, Cl. 251-158.000.

Wheelock, Kenneth S.; and Say, Geoffrey R., to Exxon Research and Engineering Company. Process for preparing a gas desulfurization sorbent. 4,045,371, Cl. 252-462.000.

Wheelwright, Robert W.; and Solender, Peter E., to Wurlitzer Company, The. Electronic phonograph selector and memory system. 4,045,776, Cl. 340-162.000.

Whicker, Stephen L.: *See*—
Dix, Robert M.; Tobias, Samuel F.; and Whicker, Stephen L., 4,044,567, Cl. 62-6.000.

White, Robert S., Jr., to GTE Sylvania Incorporated. Welding process for slotted tungsten rod. 4,045,645, Cl. 219-118.000.

White, Russell L.; and Edwards, Kenneth L., to Aluminum Company of America. Bath level set point control in an electrolytic cell and method of operating same. 4,045,308, Cl. 204-67.000.

Whitlock, Donald E.: *See*—
Babunovic, Momir; and Whitlock, Donald E., 4,044,783, Cl. 134-73.000.

Whitney Research Tool Company: *See*—
Matousek, Stephen; and Koch, Ulrich H., 4,044,631, Cl. 74-606.00R.

Whittaker, Francis E.: *See*—
McDonald, Donald C.; Ela, Roger B.; and Whittaker, Francis E., 4,044,894, Cl. 214-1.0QD.

Wick, Gerald H., to Outboard Marine Corporation. Lawn mower blade clutch and brake. 4,044,533, Cl. 56-11.300.

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Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Wieder, Rodney L.; Neetz, Michael A.; and Sell, Earl O. Apparatus and method for handling garment hangers. 4,045,067, Cl. 294-15.000.

Wiegers, Wilhelmus Johannes; and Hall, John B., to International Flavors & Fragrances Inc. Process for producing cis-jasmone. 4,045,489, Cl. 260-586.00C.

Wiese, Wolfgang: *See*—
Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, 4,044,659, Cl. 93-77.0FT.

Wieske, Theophil, to Lever Brothers Company. Margarine fat. 4,045,588, Cl. 426-607.000.

Wiesmeier, Georg: *See*—
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Wiher, Wilfried: *See*—
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Wilder, Frank A., to General Electric Company. Conveyor mechanism. 4,044,649, Cl. 89-33.0BB.

Wildhaber, Ernest. Flexing-disk coupling. 4,044,571, Cl. 64-13.000.

Wildhaber, Ernest. Twin channel reduction drive with electric motor. 4,044,632, Cl. 74-665.00G.
Wilfert, Karl; Schmid, Walter; and Jambor, Arno, to Daimler-Benz Aktiengesellschaft. Passenger motor vehicle. 4,045,052, Cl. 280-701.000.
Wilhelm, George M. Method and device for controlling radiation. 4,045,818, Cl. 358-245.000.
Wilhelm, Manfred: *See—*
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Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, to Ciba-Geigy Corporation. Pharmaceutical preparation using 9-(2-hydroxy-3-amino-propyl)-9,10-dihydro-9,10-ethano-anthracenes as antidepressants. 4,045,580, Cl. 424-330.000.
Wilkerson, Larry A.: *See—*
Barecki, Chester J.; and Wilkerson, Larry A., 4,045,080, Cl. 297-283.000.
Wilkins, John Thomas, to R. G. Dixon & Company Limited. Floor treating machines. 4,044,848, Cl. 180-6.500.
Wilkus, Edward V.: *See—*
Lever, Ray C.; and Wilkus, Edward V., 4,045,403, Cl. 260-42.420.
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Williams, Cole C. Display device and method of making same. 4,044,483, Cl. 40-152.000.
Williams, Gary E., to Armstrong Cork Company. Method of inhibiting plasticizer migration from plasticized poly(vinyl chloride) substrates. 4,045,600, Cl. 427-379.000.
Williams, Harrison L.; and Banhidy, Detre M., to Preformed Line Products Co. Diffuser attachment for a fluorescent lamp fixture. 4,045,665, Cl. 240-51.11R.
Williams, James F. Boat motor display and work stand. 4,044,978, Cl. 248-13.000.
Williams, Malcolm; and Jones, Christopher Robin, to Lucas Electrical Company Limited. Pollution control arrangements for engines. 4,044,738, Cl. 123-119.00A.
Williams, Michael R.; and McDonald, Dean T., to FMC Corporation. Folding boom. 4,044,952, Cl. 239-165.000.
Williamson Corporation: *See—*
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Williston, David Wyckoff; Bancroft, Lewis Clinton; and Hiller, Dale Murray, to Du Pont de Nemours, E. I., and Company. Process for the preparation of ferromagnetic chromium dioxide. 4,045,544, Cl. 423-607.000.
Wilson, Richard Arnold: *See—*
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Winsor, Malcolm C. Wheelchair. 4,044,850, Cl. 180-9.20C.
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Witzel, Frank: *See—*
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Wolfe, Court Lone; and Krutz, Ronald Louis, to W. R. Grace & Co. Fluorescent gas analyzer. 4,045,679, Cl. 250-461.00R.
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Wolfe, Maurice Leonard: *See—*
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Wood, Bruce G. Surfboard leash. 4,044,415, Cl. 9-310.00E.
Woodbridge, Joseph Eliot: *See—*
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Woodbury, Henry H.: *See—*
Kingsley, Jack D.; and Woodbury, Henry H., 4,045,675, Cl. 250-370.000.
Wooldridge, Darrel M., to American Tractor Equipment Corporation. Automatic control for ripper tool. 4,044,838, Cl. 172-2.000.
Worcester, John L.; and Hubbs, John C., to E-H Research Laboratories, Inc. Apparatus for testing electronic devices having a high density array of pin leads. 4,045,735, Cl. 324-158.00F.
Worden, Donald A.; de Versterre, William I.; and Petry, Henry Alfred, to Marotta Scientific Controls, Inc. Rolling mill gap sensor. 4,044,580, Cl. 72-21.000.
Worick, Richard A., to Fleming, Charles W.; Meier, Gerald H.; Rasdall, Milton; and Laas, William. Flexible multi-section implement. 4,044,842, Cl. 172-314.000.
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Wu, Chin Ching; and Krenzer, John, to Velsicol Chemical Corporation. 1-Benzothiazolyl-5-pyridylcarbonyloxyimidazolidinones. 4,045,446, Cl. 260-294.80C.
Wulff, Peter, to Siemens Aktiengesellschaft. X-ray image intensifier. 4,045,700, Cl. 313-242.000.
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Wylie, Glenn John. Cheque writing desk and control system. 4,044,694, Cl. 108-28.000.
Wyman, Charles E.; and Holstead, Robert D., to Monsanto Company. Device for separation of liquid from paste or semi-solid. 4,045,354, Cl. 210-523.000.
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Bean, Lloyd F., 4,045,219, Cl. 96-1.200.
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Markle, Robert Eugene, 4,045,779, Cl. 364-900.000.
Marshall, Richard C., 4,045,750, Cl. 333-6.000.
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Yamaguchi, Masatugu: *See—*
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Yamazaki, Eiichi; and Kanai, Hiromi, to Hitachi, Ltd. Method for making phosphor screen for black matrix type color picture tube using two light sources. 4,045,224, Cl. 96-36.100.

Yamazaki, Noboru; and Higashi, Fukuji, to Sumitomo Chemical Company, Limited. Production of aromatic polyamides. 4,045,417, Cl. 260-78.00A.

Yamazoe, Hiroshi: *See*—
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Yanagawa, Itiro; and Suzuki, Isao, to Jidosha Kiki Co., Ltd. Relay valve combined with a load-sensing proportion valve. 4,045,094, Cl. 303-22.00R.

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Yashiro, Katuo: *See*—
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Yashiro, Kenji; and Saeki, Yoshifumi, to Pioneer Electronic Corporation. Device for sensing the operative status of electrical equipment. 4,045,732, Cl. 324-133.000.

Yasuda, Michio: *See*—
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Yasui, Kiyoshi: *See*—
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Yasutome, Osamu; and Takeda, Mitsuo, to Tokyo Shibaura Electric Co., Ltd. Fluorescent character indicating tube. 4,045,702, Cl. 313-496.000.

Yasytome, Osamu: *See*—
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Yeda Research and Development Co. Ltd.: *See*—
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Yen, Shiao-Ping S.: *See*—
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Yen, Teh Fu; and Wen, Chaur-Shyong, to University of Southern California, The. Electrolytic recovery from bituminous materials. 4,045,313, Cl. 204-131.000.

Yip, James K., to Eaton Corporation. Load sensing steering system with dual power source. 4,044,786, Cl. 137-101.000.

Yoder, Alan C.; and Weber, John E., to Bowmar Instrument Corporation. Keyboard switch assembly having printed circuit board with plural layer exposed contacts and undersurface jumper connections. 4,045,636, Cl. 200-292.000.

Yokomizo, Yuji: *See*—
Ichinose, Noboru; Yokomizo, Yuji; and Katsura, Masaki, 4,045,764, Cl. 338-34.000.

Yokota, Ittshu, to Ishigaki Kiko Co., Ltd., a part interest. Apparatus for treating waste water. 4,045,344, Cl. 210-106.000.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Douri, Hisashi, 4,044,445, Cl. 29-706.000.
Ebata, Hiroyuki, 4,044,432, Cl. 24-205.16R.
Nakada, Katsuo, 4,044,504, Cl. 49-425.000.

Yoshida, Toshiro: *See*—
Tateno, Hidenori; Yoshida, Toshiro; and Hirasawa, Koichi, 4,044,736, Cl. 123-119.00F.

Yoshida, Yasutoshi: *See*—
Nishimura, Akira; Akamatsu, Hiroshi; Negoro, Sentaro; and Yoshida, Yasutoshi, 4,044,495, Cl. 43-121.000.

Yoshida, Yoshinari: *See*—
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,045,766, Cl. 340-1.00R.

Yoshimi, Toshikazu: *See*—
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,045,695, Cl. 310-322.000.

Young, Carter R.: *See*—
Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., 4,044,827, Cl. 166-133.000.

Young, Danny J., to Fair, James W. Rechargeable flashlight assembly. 4,045,663, Cl. 240-10.6CH.

Young, Robert Hayward; and Matzner, Markus, to Union Carbide Corporation. Apparatus for copolymerizing gaseous monomers. 4,045,180, Cl. 23-260.000.

Young, Robert S.: *See*—
Young, Walter M.; and Young, Robert S., 4,044,490, Cl. 43-42.060.

Young, Walter M.; and Young, Robert S. Fishing lure. 4,044,490, Cl. 43-42.060.

Youngstown Sheet and Tube Company: *See*—
Griffith, Robert G., 4,044,582, Cl. 72-97.000.

Yu, Se Puan; and Glover, Gary H., to General Electric Company. Microwave proximity detector. 4,045,727, Cl. 324-58.50B.

Yukiyasu, Tanaka: *See*—
Masaaki, Noguchi; Yukıyasu, Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, 4,044,730, Cl. 123-75.00B.

Zabelnikov, Nikola: Sergeevich: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Zacharski, Edward J.: *See*—
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 4,045,814, Cl. 358-124.000.

Zakharov, Leonid Sergeevich: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Zander, Robert W., to General Motors Corporation. Viscous damper for smoothing torsional and bending vibrations in rotating shafts. 4,044,627, Cl. 74-574.000.

Zazzara, Joseph R. Dough forming and cutting machine. 4,045,151, Cl. 425-297.000.

Zdanowski, Richard E.: *See*—
Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., 4,045,517, Cl. 260-901.000.

Zehe, Alfred: *See*—
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.

Zeigler, Kenneth H. Barbeque blower. 4,044,750, Cl. 126-25.00B.

Zelant, Gazuit: *See*—
Gazuit, Georges, 4,045,150, Cl. 425-58.000.

Zelnick, Seymour, to Weldotron Corporation. Pallet stretch-wrap apparatus. 4,044,529, Cl. 53-198.00R.

Zenith Radio Corporation: *See*—
Dougherty, Lawrence W., 4,045,701, Cl. 313-408.000.
Meehan, David H.; and Tzakis, George J., 4,045,742, Cl. 328-9.000.

Zenyaku Kogyo Kabushiki Kaisha: *See*—
Takase, Muneaki, 4,044,713, Cl. 118-19.000.

Zeuthen & Aagaard A/S: *See*—
Gorr, Theodor Wilhelm, 4,044,672, Cl. 101-132.500.

Ziegler, Gunther; Frohmader, Sigrun; and Wilhelm, Manfred, to Siemens Aktiengesellschaft. Method for the manufacture of a superconductor with a superconductive intermetallic compound of at least two elements. 4,044,456, Cl. 29-599.000.

Ziegler, William H., Jr.: *See*—
Boucher, Raymond W.; and Ziegler, William H., Jr., 4,045,045, Cl. 280-87.02W.

Ziemba, Richard T., to General Electric Company. Remotely controlled electronic fuze. 4,044,680, Cl. 102-70.20R.

Zimmermann, Volker: *See*—
Lutz, Heinz; Zimmermann, Volker; and Zuehlke, Rainer, 4,045,696, Cl. 310-49.00R.

Zocher, Josef, to Singer Company, The. Method of finless cold forming of sewing machine needle. 4,044,814, Cl. 163-5.000.

Zodrow, Rudolf, to Jagenberg Werke Aktiengesellschaft. Apparatus for applying foil labels to containers. 4,045,276, Cl. 156-571.000.

Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. 1,2-Oxaphospholanes. 4,045,518, Cl. 260-927.00R.

Zuehlke, Rainer: *See*—
Lutz, Heinz; Zimmermann, Volker; and Zuehlke, Rainer, 4,045,696, Cl. 310-49.00R.

Zust, Armin: *See*—
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 4,045,570, Cl. 424-275.000.

Zwick, Eugene B. Low emission combustion process and apparatus. 4,044,549, Cl. 60-39.020.

Zwisler, Hans: *See*—
Schleich, Josef; and Zwisler, Hans, 4,045,355, Cl. 210-532.00R.

Zytkovicz, Duane J.: *See*—
Corbin, Terry; and Zytkovicz, Duane J., 4,044,774, Cl. 128-404.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF AUGUST, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aono, Toshiaki: *See*—
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Bloom, Carl, to Worthington Compressors, Inc. Compact housing for rotary compressor system. Re. 29,378, Cl. 55-473.000.

Boschen, Henry C., Jr., to Global Marine, Inc. Method and apparatus for mooring floating vessels. Re. 29,373, Cl. 114-293.000.

Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., to International Business Machines Corporation. Recording apparatus for magnetic disks using both sides of the disk. Re. 29,380, Cl. 360-105.000.

Caton, George, to Yorkshire Switchgear and Engineering Co., Limited. Electrical switchgear with primary and secondary switch means associated with current transformer. Re. 29,381, Cl. 361-337.000.

Fuji Photo Film Co., Ltd.: *See*—
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Furutachi, Nobuo: *See*—
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Global Marine, Inc.: *See*—
Boschen, Henry C., Jr., Re. 29,373, Cl. 114-293.000.

Hirose, Takeshi: *See*—
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Hiszpanski, Jan A., to Imperial-Eastman Corporation. Welded sleeve fitting. Re. 29,376, Cl. 285-169.000.

Imperial-Eastman Corporation: *See*—
Hiszpanski, Jan A., Re. 29,376, Cl. 285-169.000.

International Business Machines Corporation: *See*—
Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., Re. 29,380, Cl. 360-105.000.

Ishiguro, Shoji: *See*—
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Johns-Manville Corporation: *See*—
Thiele, William Charles, Re. 29,375, Cl. 138-141.000.

Just, Franklin H.; Powell, Brent L.; and Waters, John A., to Just, Franklin H.; and Waters, John A. Solid state ignition circuitry. Re. 29,374, Cl. 123-148.0CC.

Katsuyama, Harumi: *See*—
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

O'Brien, Theodore Earl, to Patco Packing Limited. Apparatus for automatically stacking and compressing batts of compressible material. Re. 29,372, Cl. 100-49.000.

O'Brill, Robert. Frangible concrete-joint sealant package. Re. 29,377, Cl. 404-48.000.

Patco Packing Limited: *See*—
O'Brien, Theodore Earl, Re. 29,372, Cl. 100-49.000.

Powell, Brent L.: *See*—
Just, Franklin H.; Powell, Brent L.; and Waters, John A., Re. 29,374, Cl. 123-148.0CC.

Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. Re. 29,379, Cl. 96-74.000.

Steele, Steven G.: *See*—
Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., Re. 29,380, Cl. 360-105.000.

Thiele, William Charles, to Johns-Manville Corporation. Laminated polymeric articles and process for the production thereof. Re. 29,375, Cl. 138-141.000.

Waters, John A.: *See*—
Just, Franklin H.; Powell, Brent L.; and Waters, John A., Re. 29,374, Cl. 123-148.0CC.

Wentink, William S.: *See*—
Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., Re. 29,380, Cl. 360-105.000.

Wheeler, Stephen E.: *See*—
Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., Re. 29,380, Cl. 360-105.000.

Worthington Compressors, Inc.: *See*—
Bloom, Carl, Re. 29,378, Cl. 55-473.000.

Yorkshire Switchgear and Engineering Co., Limited: *See*—
Caton, George, Re. 29,381, Cl. 361-337.000.

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Reedley Nursery, Inc. Nectarine tree. 4,095, 8-30-77, Cl. 41.000.

Hilltop Orchards & Nurseries, Inc.: *See*—
Simmons, Dan E., 4,096, Cl. 34.000.

Reedley Nursery, Inc.: *See*—
Anderson, Frederic W., 4,095, Cl. 41.000.

Simmons, Dan E., to Hilltop Orchards & Nurseries, Inc. Apple tree. 4,096, 8-30-77, Cl. 34.000.

LIST OF DESIGN PATENTEES

AB Volvo: *See*—
de Vries, John Robert, 245,599, Cl. D12-211.000.

Aktiebolaget Platmanufaktur: *See*—
Larsson, Lars Goran; and Bruke, Richard Leroy, 245,580, Cl. D9-237.000.

Aldermaston Inc.: *See*—
Bru, Dorothea, 245,585, Cl. D10-56.000.

Amba Marketing Systems, Inc.: *See*—
Casser, Constantine, 245,645, Cl. D87-3.00F.

American Can Company: *See*—
Bianchard, Richard Lewis, 245,564, Cl. D7-40.000.

AMF Incorporated: *See*—
Davidson, William G., 245,592, Cl. D12-16.000.

Anders, Peter: *See*—
Cohen, Alan B.; Marx, Robert S.; Kalmes, Mary; and Anders, Peter, 245,596, Cl. D12-115.000.

Balduman, Agapito P. Rear view mirror for vehicles. 245,598, 8-30-77, Cl. D12-187.000.

Bell Telephone Laboratories, Incorporated: *See*—
Genaro, Donald Michael; Meyerle, John Alfons; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, 245,602, Cl. D14-63.000.

Benoit, Jean Leon Paul Marie. Biological reaction filter for medical analysis. 245,625, 8-30-77, Cl. D24-21.000.

Berry, Lambert D. Ventilator for a water closet. 245,620, 8-30-77, Cl. D23-71.000.

Berry, Lambert D. Ventilator for a water closet. 245,621, 8-30-77, Cl. D23-71.000.

Bies, Sylvester W.: *See*—
West, Robert F.; and Bies, Sylvester W., 245,570, Cl. D8-99.000.

Blanchard, Richard Lewis, to American Can Company. Cover for a plate. 245,564, 8-30-77, Cl. D7-40.000.

Boehm, Michael: *See*—
Woodring, Cooper C.; Emmerling, Ronald; and Boehm, Michael, 245,613, Cl. D16-42.000.
Bonny Products, Inc.: *See*—
Steiner, Fred S.; and Cousins, Morison S., 245,565, Cl. D7-47.000.
Braun Aktiengesellschaft: *See*—
Ullmann, Roland, 245,629, Cl. D28-49.000.
Brio Toy AB: *See*—
Hagland-Ahrnborg, Kerstin Margaretha, 245,638, Cl. D34-15.00J.
Britschgi, Robert H.: *See*—
Frinzel, Jerry C.; and Britschgi, Robert H., 245,575, Cl. D8-499.000.
Brookshire, Phillip: *See*—
McGlynn, John F.; Doernberg, Robert; and Brookshire, Phillip, 245,586, Cl. D10-57.000.
Brown, Jerry A. Cup dispenser. 245,549, 8-30-77, Cl. D6-25.000.
Bru, Dorothea, to Aldermaston Inc. Moisture meter or similar article. 245,585, 8-30-77, Cl. D10-56.000.
Bruke, Richard Leroy: *See*—
Larsson, Lars Goran; and Bruke, Richard Leroy, 245,580, Cl. D9-237.000.
Burns, Lee V. Disposal figurine. 245,567, 8-30-77, Cl. D7-194.000.
Burroughs, Robert C., to Burroughs, Robert C. Combined pencil well and calendar holder. 245,615, 8-30-77, Cl. D19-85.000.
Byram, David C., to Minnesota Mining and Manufacturing Company. Radiation detector. 245,584, 8-30-77, Cl. D10-47.000.
Campbell, John M. Combined golf ball and model aircraft engine novelty device. 245,635, 8-30-77, Cl. D34-5.0QQ.
Casser, Constantine, to Amba Marketing Systems, Inc. Combined handbag and detachabie fitted clutch. 245,645, 8-30-77, Cl. D87-3.00F.
Champion International Corporation: *See*—
Meeker, David M., 245,614, Cl. D19-3.000.
Chaves, Robert M. Measuring gauge and tool for macrame card or the like. 245,587, 8-30-77, Cl. D10-71.000.
Churchward, Roy Alexander. Golf club sole plate. 245,634, 8-30-77, Cl. D34-5.0GC.
Cognata, Larry Monroe; and Williams, Richard D., to Murray Ohio Manufacturing Company, The. Garden tractor. 245,604, 8-30-77, Cl. D15-23.000.
Cohen, Alan B.; Marx, Robert S.; Kalmes, Mary; and Anders, Peter. Bicycle rack. 245,596, 8-30-77, Cl. D12-115.000.
Colgate-Palmolive Company: *See*—
Klingaman, Richard James, 245,578, Cl. D9-171.000.
Sawyer, Ralph Vincent, 245,636, Cl. D34-5.0ST.
Conner, Charles M.; and Ladwig, Kurt G. Doghouse. 245,631, 8-30-77, Cl. D30-1.000.
Cooper Industries: *See*—
Ferguson, William C., 245,569, Cl. D8-57.000.
Courtois, Peter D.; and Sharav, Charles J., to Superior Concrete Accessories, Inc. Sleeve anchor for a sandwich panel. 245,574, 8-30-77, Cl. D8-385.000.
Cousins, Morison S.: *See*—
Steiner, Fred S.; and Cousins, Morison S., 245,565, Cl. D7-47.000.
Davidson, William G., to AMF Incorporated. Combined golf car and removable canopy therefor. 245,592, 8-30-77, Cl. D12-16.000.
Dazey Products Company: *See*—
McNair, Samuel L., 245,555, Cl. D6-95.000.
DeFuccio, Robert, to Stow & Davis Furniture Company. Chair. 245,550, 8-30-77, Cl. D6-69.000.
De Fuccio, Robert, to Stow & Davis Furniture Company. Chair. 245,551, 8-30-77, Cl. D6-72.000.
De Fuccio, Robert, to Stow & Davis Furniture Company. Chair. 245,552, 8-30-77, Cl. D6-75.000.
De Fuccio, Robert, to Stow &. Davis Furniture Company. Chair. 245,553, 8-30-77, Cl. D6-75.000.
Devin, Patricia L. Quilt. 245,563, 8-30-77, Cl. D6-260.000.
de Vries, John Robert, to AB Volvo. Wheel. 245,599, 8-30-77, Cl. D12-211.000.
Doernberg, Robert: *See*—
McGlynn, John F.; Doernberg, Robert; and Brookshire, Phillip, 245,586, Cl. D10-57.000.
Draisey, Delbert L.: *See*—
Gee, Lawrence A.; and Draisey, Delbert L., 245,597, Cl. D12-169.000.
Edlin, William Joel Reginald. Clothes peg. 245,568, 8-30-77, Cl. D7-198.000.
Emmerling, Ronald: *See*—
Woodring, Cooper C.; Emmerling, Ronald; and Boehm, Michael, 245,613, Cl. D16-42.000.
Enners, Richard Walton. Room divider. 245,560, 8-30-77, Cl. D6-139.000.
Ernest, Robert O., to Sunbeam Corporation. Blade guard for hair trimming and clipping apparatus. 245,630, 8-30-77, Cl. D28-54.000.
Ferguson, William C., to Cooper Industries. Shears. 245,569, 8-30-77, Cl. D8-57.000.
Freer, Edgar P. Drilling machine. 245,609, 8-30-77, Cl. D15-132.000.
Frick, Berndt Ebbe. Sound reducing cover for teleprinter or the like. 245,628, 8-30-77, Cl. D14-93.000.
Frinzel, Jerry C.; and Britschgi, Robert H., to Britschgi, Robert H. Electrical outlet guard. 245,575, 8-30-77, Cl. D8-499.000.
Gee, Lawrence A.; and Draisey, Delbert L. Bumper. 245,597, 8-30-77, Cl. D12-169.000.
Genaro, Donald Michael; Meyerle, John Alfons; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, to Bell Telephone Laboratories, Incorporated. Telephone station handset. 245,602, 8-30-77, Cl. D14-63.000.
Gillette Company, The: *See*—
Muscatiello, Ralph A.; and Wright, Kent M., 245,576, Cl. D9-2.000.
Graham, John F.; and Kelemen, Donald D. Document handling cart or similar article. 245,594, 8-30-77, Cl. D12-30.000.
Hagland-Ahrnborg, Kerstin Margaretha, to Brio Toy AB. Cradle gym. 245,638, 8-30-77, Cl. D34-15.00J.
Halpern, Carol. Manually propelled and steered cart for invalid children. 245,593, 8-30-77, Cl. D12-26.000.
Hanson Limited: *See*—
Mox, Dana W., 245,582, Cl. D10-40.000.
Hardee's Food Systems, Inc.: *See*—
Poelvoorde, Raymond, 245,626, Cl. D25-25.000.
Hodge, Donald G. Wheel balance weight. 245,600, 8-30-77, Cl. D12-215.000.
Hodge, Donald G. Wheel balance weight. 245,601, 8-30-77, Cl. D12-213.000.
Hoge, Henri H. Ionization sensor for smoke detector. 245,588, 8-30-77, Cl. D10-121.000.
Hygena Limited: *See*—
Robinson, George Henry, 245,558, Cl. D6-130.000.
Robinson, George Henry, 245,561, Cl. D6-166.000.
Robinson, George Henry, 245,562, Cl. D6-170.000.
Robinson, George Henry, 245,619, Cl. D23-59.000.
Instituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A.: *See*—
Mannucci, Enzo Sergio, 245,583, Cl. D10-46.000.
IPCO Hospital Supply Corporation: *See*—
McGlynn, John F.; Doernberg, Robert; and Brookshire, Phillip, 245,586, Cl. D10-57.000.
J. B. Foote Foundry Co., The: *See*—
Jones, Ronald N., 245,610, Cl. D15-149.000.
Jones, Ronald N., 245,611, Cl. D15-149.000.
J. C. Penney Company, Inc.: *See*—
Woodring, Cooper C.; Emmerling, Ronald; and Boehm, Michael, 245,613, Cl. D16-42.000.
Jenkins, James Harlan. Thermal deflector for fireplaces. 245,623, 8-30-77, Cl. D23-94.000.
Jewell, Donald K., to Restaurant Technology, Inc. Packaging container. 245,579, 8-30-77, Cl. D9-231.000.
Jewett, Harvey H. Toy airplane. 245,637, 8-30-77, Cl. D34-15.0HH.
Johnson, Bennie R., to National Metal Products Co. Inc. Casket handle. 245,633, 8-30-77, Cl. D31-11.000.
Johnson, Frank W. Hand cart for carrying a door. 245,595, 8-30-77, Cl. D12-34.000.
Jones, Ronald N., to J. B. Foote Foundry Co., The. Small transmission. 245,610, 8-30-77, Cl. D15-149.000.
Jones, Ronald N., to J. B. Foote Foundry Co., The. Reversing gear box. 245,611, 8-30-77, Cl. D15-149.000.
Josten's: *See*—
Laidlaw, Robert C., 245,590, Cl. D11-36.000.
Kabushiki Kaisha Izumi Seisakusho: *See*—
Ono, Toru, 245,571, Cl. D8-397.000.
Ono, Toru, 245,572, Cl. D8-397.000.
Ono, Toru, 245,573, Cl. D8-397.000.
Kalmes, Mary: *See*—
Cohen, Alan B.; Marx, Robert S.; Kalmes, Mary; and Anders, Peter, 245,596, Cl. D12-115.000.
Kelemen, Donald D.: *See*—
Graham, John F.; and Kelemen, Donald D., 245,594, Cl. D12-30.000.
Kibler, Fred: *See*—
Rieger, Fred, Jr.; and Kibler, Fred, 245,591, Cl. D11-44.000.
Kishi, Yoshio, to Sony Corporation. Tape cassette. 245,627, 8-30-77, Cl. D14-11.000.
Kitson, Gerald L. Poultry cage. 245,632, 8-30-77, Cl. D30-1.000.
Klingaman, Richard James, to Colgate-Palmolive Company. Packaging capsule. 245,578, 8-30-77, Cl. D9-171.000.
Ladwig, Kurt G.: *See*—
Conner, Charles M.; and Ladwig, Kurt G., 245,631, Cl. D30-1.000.
Laidlaw, Robert C., to Josten's. Finger ring. 245,590, 8-30-77, Cl. D11-36.000.
Larsson, Lars Goran; and Bruke, Richard Leroy, to Aktiebolaget Platmanufaktur. Packaging container. 245,580, 8-30-77, Cl. D9-237.000.
Lucid Lines, Inc.: *See*—
Thrasher, Virgil, 245,581, Cl. D10-9.000.
Mannucci, Enzo Sergio, to Instituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A. Photometric analysis apparatus. 245,583, 8-30-77, Cl. D10-46.000.
Marx, Robert S.: *See*—
Cohen, Alan B.; Marx, Robert S.; Kalmes, Mary; and Anders, Peter, 245,596, Cl. D12-115.000.
McGlynn, John F.; Doernberg, Robert; and Brookshire, Phillip, to IPCO Hospital Supply Corporation. Temperature sensing mechanism or similar article. 245,586, 8-30-77, Cl. D10-57.000.
McIntire, John E.: *See*—
McIntire, Kendrick H.; and McIntire, John E., 245,624, Cl. D23-105.000.
McIntire, Kendrick H.; and McIntire, John E. Wood burning heating stove. 245,624, 8-30-77, Cl. D23-105.000.
McNair, Samuel L., to Dazey Products Company. Dispenser for hot shaving lather. 245,555, 8-30-77, Cl. D6-95.000.
Meeker, David M., to Champion International Corporation. Blank for an envelope. 245,614, 8-30-77, Cl. D19-3.000.

Meyer, Jeanne M. Nozzle holder for garden hose. 245,556, 8-30-77, Cl. D6-112.000.

Meyerle, John Alfons: *See*—
Genaro, Donald Michael; Meyerle, John Alfons; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, 245,602, Cl. D14-63.000.

Minnesota Mining and Manufacturing Company: *See*—
Byram, David C., 245,584, Cl. D10-47.000.

Morgan, Lael. Tatting shuttle. 245,548, 8-30-77, Cl. D3-19.00A.

Morrical, Jade Del. Cycle chain cleaning device. 245,607, 8-30-77, Cl. D15-34.000.

Mox, Dana W., to Hanson Limited. Kitchen timer or similar article. 245,582, 8-30-77, Cl. D10-40.000.

Murphy, William V., to Refreshment Machinery, Incorporated. Water dispenser. 245,608, 8-30-77, Cl. D15-115.000.

Murray Ohio Manufacturing Company, The: *See*—
Cognata, Larry Monroe; and Williams, Richard D., 245,604, Cl. D15-23.000.

Muscatiello, Ralph A.; and Wright, Kent M., to Gillette Company, The. Bottle. 245,576, 8-30-77, Cl. D9-2.000.

National Metal Products Co. Inc.: *See*—
Johnson, Bennie R., 245,633, Cl. D31-11.000.

Okuda, Yoshizo. Diaper cover. 245,546, 8-30-77, Cl. D2-10.000.

Ono, Toru, to Kabushiki Kaisha Izumi Seisakusho. Cap nut. 245,571, 8-30-77, Cl. D8-397.000.

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Orfei, John. Combined flower pot and tray therefor. 245,643, 8-30-77, Cl. D11-154.000.

Ott, James H. Cabinet for intruder deterrent. 245,589, 8-30-77, Cl. D10-121.000.

Pitman, Emilie H. Showerhead. 245,618, 8-30-77, Cl. D23-35.000.

Poelvoorde, Raymond, to Hardee's Food Systems, Inc. Building for fast food restaurant or the like. 245,626, 8-30-77, Cl. D25-25.000.

Pollard, Jack E., to Transamerica Corporation. Font of type. 245,644, 8-30-77, Cl. D64-12.00B.

Powell, Elmer C., Jr. Toy house. 245,639, 8-30-77, Cl. D34-15.0LL.

Powell, Elmer C., Jr. Toy fort. 245,640, 8-30-77, Cl. D34-15.0LL.

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Refreshment Machinery, Incorporated: *See*—
Murphy, William V., 245,608, Cl. D15-115.000.

Restaurant Technology, Inc.: *See*—
Jewell, Donald K., 245,579, Cl. D9-231.000.

Rieger, Fred, Jr.; and Kibler, Fred. Pendant. 245,591, 8-30-77, Cl. D11-44.000.

Robinson, George Henry, to Hygena Limited. Kitchen cabinet. 245,558, 8-30-77, Cl. D6-130.000.

Robinson, George Henry, to Hygena Limited. Kitchen base cabinet. 245,561, 8-30-77, Cl. D6-166.000.

Robinson, George Henry, to Hygena Limited. Kitchen cabinet. 245,562, 8-30-77, Cl. D6-170.000.

Robinson, George Henry, to Hygena Limited. Kitchen sink cabinet. 245,619, 8-30-77, Cl. D23-59.000.

Satoh, Kazuhisa. Antenna element. 245,603, 8-30-77, Cl. D14-90.000.

Sawyer, Ralph Vincent, to Colgate-Palmolive Company. Tennis racket frame. 245,636, 8-30-77, Cl. D34-5.0ST.

Scholle Corporation: *See*—
Scholle, William R., 245,559, Cl. D6-131.000.

Scholle, William R., to Scholle Corporation. Mountable holder for a bag containing a fluent substance. 245,559, 8-30-77, Cl. D6-131.000.

Sharav, Charles J.: *See*—
Courtois, Peter D.; and Sharav, Charles J., 245,574, Cl. D8-385.000.

Smythe, Wayne M. Jug or the like. 245,577, 8-30-77, Cl. D9-52.000.

Sony Corporation: *See*—
Kishi, Yoshio, 245,627, Cl. D14-11.000.

Spivey, Arlie. Fishing jig. 245,617, 8-30-77, Cl. D22-27.000.

Stanley Works, The: *See*—
West, Robert F.; and Bies, Sylvester W., 245,570, Cl. D8-99.000.

Steiner, Fred S.; and Cousins, Morison S., to Bonny Products, Inc. Strainer. 245,565, 8-30-77, Cl. D7-47.000.

Stewart, Hugh, Jr. Fishing lure. 245,616, 8-30-77, Cl. D22-28.000.

Storandt, Duane L. Charcoal fire starter. 245,622, 8-30-77, Cl. D23-90.100.

Stow & Davis Furniture Company: *See*—
DeFuccio, Robert, 245,550, Cl. D6-69.000.
De Fuccio, Robert, 245,551, Cl. D6-72.000.
De Fuccio, Robert, 245,552, Cl. D6-75.000.
De Fuccio, Robert, 245,553, Cl. D6-75.000.

Sunbeam Corporation: *See*—
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Sylvester, Gordon Elliot: *See*—
Genaro, Donald Michael; Meyerle, John Alfons; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, 245,602, Cl. D14-63.000.

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Tomaras, Chris P. Rotisserie cooker. 245,566, 8-30-77, Cl. D7-110.000.

Transamerica Corporation: *See*—
Pollard, Jack E., 245,644, Cl. D64-12.00B.

Ullmann, Roland, to Braun Aktiengesellschaft. Dry shaver. 245,629, 8-30-77, Cl. D28-49.000.

West, Robert F.; and Bies, Sylvester W., to Stanley Works, The. Retractable blade knife. 245,570, 8-30-77, Cl. D8-99.000.

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Williams, Willard R., 245,606, Cl. D15-28.000.

Williams, Richard D.: *See*—
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Williams, Willard R., to Williams, Inc. Load transfer apparatus for connecting a tractor and a trailer. 245,606, 8-30-77, Cl. D15-28.000.

Wiser, John A. Valet rack. 245,557, 8-30-77, Cl. D6-117.000.

Wittke, Rudolph H. Multipurpose tractor having a front adjustable tool support. 245,605, 8-30-77, Cl. D15-23.000.

Woodring, Cooper C.; Emmerling, Ronald; and Boehm, Michael, to J. C. Penney Company, Inc. Strobe. 245,613, 8-30-77, Cl. D16-42.000.

Wright, Kent M.: *See*—
Muscatiello, Ralph A.; and Wright, Kent M., 245,576, Cl. D9-2.000.

Young, Ross. Toy vehicle or the like. 245,641, 8-30-77, Cl. D34-15.0AJ.

Young, Ross. Toy vehicle or the like. 245,642, 8-30-77, Cl. D34-15.0AJ.

Zeuthen & Aagaard A/S: *See*—
Zeuthen, Kal Gustav, 245,612, Cl. D16-31.000.

Zeuthen, Kal Gustav, to Zeuthen & Aagaard A/S. Electrophoto copier. 245,612, 8-30-77, Cl. D16-31.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 30, 1977

NOTE—First number, class; second number, subclass; third number, patent number

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59 4,044,840
72 4,044,841
314 4,044,842
802 4,044,843

CLASS 173

73 4,044,844

CLASS 174

121 SR 4,045,611
136 4,045,612

CLASS 175

409 4,044,845

CLASS 176

19 R 4,045,282
35 4,045,283
38 4,045,284
39 4,045,285
49 4,045,286
78 4,045,287
82 4,045,288
87 4,045,289

CLASS 177

165 4,044,846
210 R 4,044,847

CLASS 178

69.1 4,045,613
4,045,614

CLASS 179

1 CN 4,045,615
1 SA 4,045,616
15 AT 4,045,617
15 BS 4,045,618
18 DA 4,045,619
84 VF 4,045,620
100.4 ST 4,045,621
175.2 C 4,045,622
175.2 R 4,045,623
175.3 R 4,045,624

CLASS 180

6.5 4,044,848
6.7 4,044,849
9.2 C 4,044,850
33 C 4,044,851
68.5 4,044,852
98 4,044,853
140 4,044,854

CLASS 181

151 4,044,855

CLASS 182

2 4,044,856
17 4,044,857
82 4,044,858

CLASS 184

18 4,044,859

CLASS 187

29 R 4,044,860

CLASS 188

1 B 4,044,861
5 4,044,862
65.1 4,044,863
73.3 4,044,864
287 4,044,865
322 4,044,866

CLASS 190

43 4,044,867

CLASS 192

12 B 4,044,868
48.91 4,044,869
89 W 4,044,870
91 A 4,044,871
103 A 4,044,872
106.2 4,044,873
4,044,874

CLASS 193

35 SS 4,044,876

CLASS 194

1 K 4,044,875
10 4,044,877

CLASS 195

80 R 4,045,298
99 4,045,290
103.5 R 4,045,296
4,045,297
127 4,045,291

CLASS 197

1 R 4,044,878
4,044,879
18 4,044,880
82 4,044,881
4,044,882
151 4,044,883

CLASS 198

415 4,044,884
419 4,044,885
488 4,044,886
526 4,044,887

CLASS 200

24 4,045,625
30 R 4,045,626
37 R 4,045,627
50 C 4,045,628
52 R 4,045,629
4,045,630
61.43 4,045,631
67 PK 4,045,632
148 A 4,045,633
148 B 4,045,634
153 K 4,045,650
283 4,045,635
292 4,045,636
303 4,045,637

CLASS 201

1 4,045,292

CLASS 202

93 4,045,299

CLASS 203

10 4,045,293
69 4,045,294
79 4,045,295

CLASS 204

1 T 4,045,300
12 4,045,301
15 4,045,302
24 4,045,303
49 4,045,304
50 R 4,045,305
55 R 4,045,306
64 4,045,307
67 4,045,308
4,045,309
129.4 4,045,310
129.55 4,045,311
129.65 4,045,312
131 4,045,313
151 4,045,314
157.1 R 4,045,315
158 R 4,045,316
159.23 4,045,317
192 E 4,045,318
195 S 4,045,319
197 4,045,320
202 4,045,321
263 4,045,322
266 4,045,323
268 4,045,324
286 4,045,325
299 R 4,045,326
4,045,327

CLASS 206

330 4,044,888
459 4,044,889
493 4,044,890

CLASS 208

8 4,045,328
10 4,045,329
180 4,045,330
213 4,045,331
323 4,045,332
327 4,045,333

CLASS 209

73 4,044,891
4,044,892
141 4,045,334
166 4,045,335

CLASS 210

15 4,045,336
23 H 4,045,337
36 4,045,338
45 4,045,339
4,045,340
4,045,341
81 4,045,342
101 4,045,343
106 4,045,344
107 4,045,345
164 4,045,346
199 4,045,347
230 4,045,348
232 4,045,349
4,045,350
238 4,045,351
500 M 4,045,352
502 4,045,353
523 4,045,354
532 R 4,045,355

CLASS 214

1 PB 4,044,893
1 QD 4,044,894
2.5 4,044,895
8.5 H 4,044,896
11 R 4,044,897
18 N 4,044,898
82 4,044,899
86 A 4,044,900
89 4,044,901
132 4,044,902
138 R 4,044,903
152 4,044,904
4,044,905
506 4,044,906
4,044,907

CLASS 219

10.55 A 4,045,638
4,045,639
10.55 B 4,045,640
69 C 4,045,641
70 4,045,642
98 4,045,643
118 4,045,645
119 4,045,644
121 EB 4,045,646
4,045,647
137 R 4,045,648
143 4,045,649
227 4,045,651
363 4,045,652
438 4,045,653
449 4,045,654

CLASS 220

3.8 4,044,908
4,044,909
7 4,044,910
9 LG 4,044,911
63 R 4,044,912
86 R 4,044,913
93 4,044,914
270 4,044,915
4,044,916
288 4,044,917
314 4,044,918

CLASS 221

63 4,044,919

CLASS 222

58 4,044,920
74 4,044,921
183 4,044,922
190 4,044,923
250 4,044,924
263 4,044,925
409 4,044,926
604 4,044,927

CLASS 223

96 4,044,928

CLASS 224

2 B 4,044,929
2 C 4,044,930
6 4,044,931
26 R 4,044,932
4,044,933
36 4,044,934
45 F 4,044,935

CLASS 225

2 4,044,936
4,045,356
97 4,044,937

CLASS 226

168 4,044,938

CLASS 228

176 4,044,939

CLASS 229

40 4,044,940
43 4,044,941
73 4,044,942

CLASS 233

19 A 4,044,943
20 A 4,044,944
4,044,945

CLASS 234

39 4,044,946

CLASS 235

92 PC 4,045,655
92 TC 4,045,656
151.1 4,045,657
151.11 4,045,660
151.3 4,045,658
4,045,659
153 A 4,045,662
153 AC 4,045,661

CLASS 236

13 4,044,947

CLASS 237

1 A 4,044,948
4,044,949
55 4,044,950

CLASS 239

1 4,044,951
165 4,044,952
229 4,044,953
458 4,044,954

CLASS 240

10.6 CH 4,045,663
46.03 4,045,664
51.11 R 4,045,665
61.8 4,045,666

CLASS 241

14 4,044,955
24 4,044,956
46.11 4,044,957
126 4,044,958

CLASS 242

25 A 4,044,959
4,044,960
35.5 R 4,044,961
47.05 4,044,962
54 R 4,044,963
58 4,044,964
71.8 4,044,965
77.1 4,044,966
86.5 R 4,044,967
106 4,044,968
107.4 A 4,044,969

CLASS 244

3.22 4,044,970
7 R 4,044,971
12.2 4,044,972
54 4,044,973
161 4,044,974
181 4,044,975

CLASS 248

1 4,044,976
7 4,044,977
13 4,044,978
4,044,979
4,044,980
119 R 4,044,981
183 4,044,982
293 4,044,983

CLASS 249

95 4,044,984
205 4,044,985
216 4,044,986
219 W 4,044,987

CLASS 250

226 4,045,667
227 4,045,668
272 4,045,676
311 4,045,669
338 4,045,670
341 4,045,671
360 4,045,672
364 4,045,673
370 4,045,674
4,045,675
423 R 4,045,677
451 4,045,678
461 R 4,045,679
504 4,045,680
527 4,045,359

CLASS 251

1 A 4,044,988
7 4,044,989
8 4,044,990
122 4,044,991
126 4,044,992
158 4,044,993
172 4,044,994
188 4,044,995
229 4,044,996
328 4,044,997
331 4,044,998

CLASS 252

8.3 4,045,360
8.5 A 4,045,357
8.6 4,045,358
8.8 4,045,361
14 4,045,362
49.5 4,045,363
56 S 4,045,376
106 4,045,364
141 4,045,365
171 4,045,366
181.4 4,045,367
421 4,045,368
432 4,045,369
458 4,045,370
462 4,045,371
463 4,045,372
469 4,045,373
517 4,045,374

519 4,045,375

CLASS 254

45 4,044,999
4,045,000
164 4,045,001
4,045,002

CLASS 256

59 4,045,003

CLASS 259

4 R 4,045,004
36 4,045,005

CLASS 260

2 BP 4,045,377
2.2 R 4,045,379
2.5 AH 4,045,381
2.5 AJ 4,045,378
2.5 HA 4,045,380
4 R 4,045,382
8 4,045,383
4,045,384
15 4,045,385
17.2 4,045,386
17.4 GC 4,045,387
17.4 ST 4,045,388
18 N 4,045,389
18 S 4,045,390
22 D 4,045,431
22 EP 4,045,391
22 R 4,045,392
23 AR 4,045,394
23 R 4,045,393
28.5 AS 4,045,395
29.2 TN 4,045,396
29.3 4,045,397
4,045,398
29.6 N 4,045,399
37 N 4,045,400
42.18 4,045,401
4,045,402
42.42 4,045,403
45.75 R 4,045,405
4,045,406
45.8 N 4,045,404
47 CP 4,045,407
47 EA 4,045,408
49 4,045,409
52 4,045,410
59 R 4,045,411
63 R 4,045,413
65 4,045,414
67 FP 4,045,415
77.5 CR 4,045,416
78 A 4,045,417
78.3 R 4,045,418
112 R 4,045,420
124 R 4,045,421
143 4,045,422
147 4,045,423
4,045,424
163 4,045,425
174 4,045,426
192 4,045,427
198 4,045,428
207 4,045,429
208 4,045,430
239 B 4,045,432
239.3 D 4,045,433
250 C 4,045,439
285 4,045,440
289 XA 4,045,441
293.53 4,045,443
293.58 4,045,442
4,045,444
293.59 4,045,445
294.8 C 4,045,446
307 F 4,045,447
326.5 B 4,045,448
340.2 4,045,449
343.6 4,045,450
345.2 4,045,451
345.9 S 4,045,452
347.4 4,045,453
369 4,045,454
4,045,455
4,045,456
381 4,045,457
393 4,045,458
448.8 R 4,045,459
4,045,460
449 M 4,045,461
453 AP 4,045,462
453 RZ 4,045,463
463 4,045,464
464 4,045,465
465 E 4,045,466
468 D 4,045,467
4,045,468
469 4,045,469
470 4,045,470
471 A 4,045,471
471 C 4,045,472
482 C 4,045,473
484 A 4,045,474
488 H 4,045,475
488 R 4,045,476
497 R 4,045,477
530 N 4,045,478
534 S 4,045,479
545 P 4,045,480
552 R 4,045,483
561 H 4,045,484
566 A 4,045,485
566 D 4,045,481
566 R 4,045,486
570.5 C 4,045,487
570.7 4,045,482
576 4,045,488
586 C 4,045,489
590 FA 4,045,490
594 4,045,491
604 HF 4,045,492
4,045,493
606.5 B 4,045,495
606.5 P 4,045,494
613 D 4,045,496
615 A 4,045,497
617 R 4,045,498
621 R 4,045,499
635 H 4,045,500
651 F 4,045,502
651 R 4,045,501
652.5 P 4,045,503
669 R 4,045,504
673 4,045,505
677 A 4,045,506
681 4,045,419
683.15 B 4,045,507
4,045,508
683.75 4,045,509
830 P 4,045,510
857 TW 4,045,511
4,045,512
860 4,045,513
873 4,045,514
886 4,045,516
897 A 4,045,515
901 4,045,517
927 R 4,045,518
976 4,045,519
985 4,045,520

CLASS 261

41 R 4,045,521
93 4,045,522
97 4,045,523
112 4,045,524
124 4,045,525

CLASS 264

.5 4,045,526
46.7 4,045,527
63 4,045,412
69 4,045,528
75 4,045,529
92 4,045,530
113 4,045,531
196 4,045,532
228 4,045,533
237 4,045,534
313 4,045,535
327 4,045,536

CLASS 266

149 4,045,006
268 4,045,007

CLASS 267

120 4,045,008
139 4,045,009

CLASS 269

315 4,045,010
324 4,045,078
328 4,045,011

CLASS 270

79 4,045,012

CLASS 271

8 R 4,045,014
112 4,045,015
155 4,045,016
181 4,045,017
251 4,045,018

CLASS 272

1 A 4,045,019
33 R 4,045,020
65 4,045,021

CLASS 273

29 R 4,045,022
35 B 4,045,023
43 A 4,045,024
73 F 4,045,025
96 R 4,045,026
4,045,027
104 4,045,028
106 B 4,045,029
131 AB 4,045,030
134 AT 4,045,031
136 F 4,045,013
181 F 4,045,032
188 R 4,045,033
194 B 4,045,034

CLASS 277

34.3 4,045,035
138 4,045,036
205 4,045,037

CLASS 279

2 R 4,045,038
123 4,045,039

CLASS 280

1.5 4,045,040
43.17 4,045,041
79.1 R 4,045,042
79.3 4,045,043
87.02 R 4,045,044
87.02 W 4,045,045
87.04 A 4,045,046
242 WC 4,045,047
278 4,045,048
289 R 4,045,049
492 4,045,050
644 4,045,051
701 4,045,052

CLASS 282

22 R 4,045,053

CLASS 285

18 4,045,054
33 4,045,055
41 4,045,056
49 4,045,057
119 4,045,058
169 Re.29,376
181 4,045,059
369 4,045,060

CLASS 289

18 4,045,061

CLASS 290

38 R 4,045,062

CLASS 292

110 4,045,063
125 4,045,064
341.17 4,045,065

CLASS 294

5.5 4,045,066
15 4,045,067
19 A 4,045,068
31.2 4,045,069
4,045,070
67 R 4,045,071
74 4,045,072
87 A 4,045,073

CLASS 296

1 S 4,045,074
28 J 4,045,075
39 A 4,045,076
78.1 4,045,077

CLASS 297

216 4,045,079
283 4,045,080
317 4,045,081
357 4,045,082
440 4,045,090

CLASS 299

1 4,045,083
2 4,045,085
4 4,045,084
17 4,045,086
31 4,045,087
4,045,088
43 4,045,089

CLASS 302

28 4,045,091
66 4,045,092

CLASS 303

3 4,045,093
22 R 4,045,094
37 4,045,095

CLASS 305

7 4,045,096

CLASS 307

113 4,045,681
127 4,045,682
157 4,045,683
200 B 4,045,684
208 4,045,685
251 4,045,688
254 4,045,689
260 4,045,690
264 4,045,691
279 4,045,692
291 4,045,693
296 R 4,045,694
355 4,045,686
358 4,045,687

CLASS 308

3.8 4,045,097
9 4,045,098
36 4,045,099
183 4,045,100
194 4,045,101

CLASS 310

49 R 4,045,696
89 4,045,697
166 4,045,698
322 4,045,695

CLASS 312

61 4,045,102
198 4,045,103
257 R 4,045,104

CLASS 313

59 4,045,699
242 4,045,700
408 4,045,701
496 4,045,702
497 4,045,703
4,045,704

CLASS 315

3 4,045,705
3.5 4,045,706
4,045,707
4,045,708
205 4,045,709
4,045,710
209 R 4,045,711
323 4,045,712
391 4,045,713

CLASS 318

16 4,045,715
154 4,045,716

CLASS 320

2 4,045,717
17 4,045,718
35 4,045,720
43 4,045,721

CLASS 324

6 4,045,724
.5 A 4,045,723
30 B 4,045,725
51 4,045,726
58.5 B 4,045,727
59 4,045,728
71 SN 4,045,729
76 R 4,045,730
78 F 4,045,731
133 4,045,732
140 R 4,045,733
142 4,045,734
158 F 4,045,735
158 P 4,045,737
158 R 4,045,736
174 4,045,738

CLASS 325

15 4,045,739
427 4,045,740
470 4,045,741

CLASS 328

9 4,045,742
150 4,045,743

CLASS 330

13 4,045,744
15 4,045,745
23 4,045,746
35 4,045,747
126 4,045,748

CLASS 331

94.5 H 4,045,749

CLASS 333

6 4,045,750
72 4,045,753

CLASS 335

201 4,045,751
202 4,045,752
212 4,045,754
274 4,045,755
292 4,045,756

CLASS 337

85 4,045,757
186 4,045,758
301 4,045,759
4,045,760
372 4,045,761
401 4,045,762

CLASS 338

23 4,045,763
34 4,045,764
176 4,045,765

CLASS 339

17 CF 4,045,105
45 R 4,045,106
48 4,045,107
75 M 4,045,109
75 P 4,045,108
91 R 4,045,110
97 R 4,045,111
99 R 4,045,112
111 4,045,113
210 M 4,045,114

CLASS 340

1 R 4,045,766
5 R 4,045,767
52 C 4,045,768
74 4,045,769
146.1 BA 4,045,771
146.3 B 4,045,772
146.3 SG 4,045,773
147 LP 4,045,774
147 R 4,045,775
162 4,045,776
168 B 4,045,777
171 PF 4,045,778
173 R 4,045,783
4,045,785
173 SP 4,045,784
174 TF 4,045,786
197 4,045,787
323 R 4,045,788
324 AD 4,045,789
324 M 4,045,790
4,045,791
347 AD 4,045,792
347 DA 4,045,793
414 4,045,794

CLASS 343

5 CM 4,045,795
6.5 R 4,045,796
8 4,045,797
17.2 PC 4,045,798
113 PT 4,045,799
854 4,045,800

CLASS 346

75 4,045,770
140 R 4,045,801
4,045,802

CLASS 350

3.5 4,045,115
21 4,045,116
60 4,045,117
61 4,045,118
96 C 4,045,120
4,045,121
96 LM 4,045,119
97 4,045,122
117 4,045,123
160 LC 4,045,124
166 4,045,125
175 ML 4,045,126
210 4,045,127
216 4,045,128
321 4,045,129

CLASS 351

24 4,045,130
52 4,045,131
132 4,045,137
178 4,045,138

CLASS 352

91 C 4,045,132

CLASS 354

5 4,045,803
25 4,045,804
4,045,805
37 4,045,806
38 4,045,807
126 4,045,808
322 4,045,809

CLASS 355

1 4,045,133
3 R 4,045,134
11 4,045,135
83 4,045,136

CLASS 356

36 4,045,139
141 4,045,140
156 4,045,141
223 4,045,142

CLASS 357

24 4,045,810
41 4,045,811

CLASS 358

4 4,045,812
99 4,045,813
124 4,045,814
183 4,045,815
212 4,045,816
213 4,045,817
245 4,045,818

CLASS 360

8 4,045,819
85 4,045,820
105 Re.29,380
132 4,045,821

CLASS 361

45 4,045,822
58 4,045,823
156 4,045,714
337 Re.29,381

CLASS 363

89 4,045,719
126 4,045,722

CLASS 364

200 4,045,781
4,045,782
900 4,045,779
4,045,780

CLASS 403

102 4,045,143

CLASS 404

48 Re.29,377

CLASS 415

1 4,045,144
89 4,045,145

CLASS 416

1 4,045,146
84 4,045,148
100 4,045,147
135 4,045,149

CLASS 423

119 4,045,537
240 4,045,538
4,045,539
385 4,045,540
417 4,045,541
478 4,045,542
482 4,045,543
607 4,045,544
644 4,045,545
657 4,045,546

CLASS 424

28 4,045,547
47 4,045,548
60 4,045,549
70 4,045,550
76 4,045,551
94 4,045,552
132 4,045,553
164 4,045,554
174 4,045,555
177 4,045,556
200 4,045,557
232 4,045,558
246 4,045,559
248.4 4,045,560
251 4,045,561
261 4,045,562
263 4,045,563
4,045,564
4,045,565
267 4,045,566
270 4,045,567
273 4,045,568
273 P 4,045,571
274 4,045,569
275 4,045,570
4,045,572
279 4,045,573
303 4,045,574
305 4,045,575
309 4,045,576
311 4,045,577
4,045,578
330 4,045,580

CLASS 425

58 4,045,150
297 4,045,151
419 4,045,152
440 4,045,153
467 4,045,154

CLASS 426

3 4,045,581
69 4,045,582
241 4,045,583
289 4,045,584
327 4,045,579

CLASSIFICATION OF PATENTS

331	4,045,585	59	4,045,593	386	4,045,602	253	4,045,609		CLASS 432	247	4,045,168
387	4,045,586	89	4,045,594		CLASS 428		CLASS 431				CLASS 536
533	4,045,587	202	4,045,595					14	4,045,162	17	4,045,610
607	4,045,588	229	4,045,596	2	4,045,603	42	4,045,155	59	4,045,163		CLASS 542
609	4,045,589	248 A	4,045,597	36	4,045,604	95 R	4,045,156	60	4,045,164	413	4,045,434
656	4,045,590	296	4,045,598	88	4,045,605	114	4,045,157		4,045,165		CLASS 544
	CLASS 427	333	4,045,599	174	4,045,606	123	4,045,158	80	4,045,161	17	4,045,437
37	4,045,591	379	4,045,600	200	4,045,607	328	4,045,159	146	4,045,166	23	4,045,436
45	4,045,592	381	4,045,601	251	4,045,608	348	4,045,160	241	4,045,167	28	4,045,435
										29	4,045,438

CLASSIFICATION OF DESIGNS

D2—	10	245,546		260	245,563		237	245,580		115	245,596		245,611	D28—	49	245,629
	24	245,547	D7—	40	245,564	D10—	9	245,581		169	245,597	D16—	31 245,612		54	245,630
D3—	19 A	245,548		47	245,565		40	245,582		187	245,598		42 245,613	D30—	1	245,631
D6—	25	245,549		110	245,566		46	245,583		211	245,599	D19—	3 245,614			245,632
	69	245,550		194	245,567		47	245,584		213	245,600		85 245,615	D31—	11	245,633
	72	245,551		198	245,568		56	245,585			245,601	D22—	27 245,617	D34—	5 GC	245,634
	75	245,552	D8—	57	245,569		57	245,586	D14—	11	245,627		28 245,616		5 QQ	245,635
		245,553		99	245,570		71	245,587		63	245,602	D23—	35 245,618		5 ST	245,636
	85	245,554		385	245,574		121	245,588		90	245,603		59 245,619		15 AJ	245,641
	95	245,555		397	245,571			245,589		93	245,628		71 245,620			245,642
	112	245,556			245,572	D11—	36	245,590	D15—	23	245,604		245,621		15 HH	245,637
	117	245,557			245,573		44	245,591			245,605		90.1 245,622		15 J	245,638
	130	245,558		499	245,575		154	245,643		28	245,606		94 245,623		15 LL	245,639
	131	245,559	D9—	2	245,576	D12—	16	245,592		34	245,607		105 245,624			245,640
	139	245,560		52	245,577		26	245,593		115	245,608	D24—	21 245,625	D64—	12 B	245,644
	166	245,561		171	245,578		30	245,594		132	245,609	D25—	25 245,626	D87—	3 F	245,645
	170	245,562		231	245,579		34	245,595		149	245,610					

CLASSIFICATION OF PLANTS

P.—	34	4,096		41	4,095								

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PATENTS

1 : 4,044,555	4,044,790	4,045,314	4,045,028	4,045,259	4,045,264
4,045,045	4,044,793	4,045,315	4,045,138	4,045,719	4,045,275
4 : 4,044,446	4,044,821	4,045,321	4,045,684	4,045,721	4,045,284
4,044,477	4,044,830	4,045,331	4,045,740	13 : 4,044,804	4,045,289
4,044,782	4,044,838	4,045,335	9 : 4,044,433	4,044,806	4,045,387
4,045,011	4,044,843	4,045,343	4,044,514	4,044,923	4,045,402
4,045,201	4,044,854	4,045,352	4,044,520	4,045,545	4,045,407
4,045,211	4,044,856	4,045,357	4,044,728	16 : Re.29,374	4,045,442
4,045,245	4,044,867	4,045,359	4,044,817	17 : Re.29,376	4,045,446
4,045,523	4,044,900	4,045,360	4,044,847	Re.29,377	4,045,493
4,045,682	4,044,902	4,045,397	4,045,129	4,044,424	4,045,522
4,045,793	4,044,918	4,045,420	4,045,216	4,044,425	4,045,525
4,045,796	4,044,943	4,045,434	4,045,237	4,044,426	4,045,579
5 : 4,044,693	4,044,970	4,045,440	4,045,283	4,044,450	4,045,611
4,044,895	4,044,974	4,045,471	4,045,293	4,044,457	4,045,626
4,044,952	4,044,975	4,045,485	4,045,305	4,044,468	4,045,658
4,045,537	4,044,980	4,045,506	4,045,322	4,044,476	4,045,673
6 : 4,044,400	4,044,991	4,045,527	4,045,364	4,044,480	4,045,697
4,044,407	4,044,992	4,045,546	4,045,378	4,044,481	4,045,701
4,044,409	4,044,993	4,045,557	4,045,403	4,044,496	4,045,726
4,044,413	4,045,002	4,045,559	4,045,436	4,044,505	4,045,733
4,044,414	4,045,005	4,045,568	4,045,437	4,044,506	4,045,742
4,044,415	4,045,018	4,045,585	4,045,465	4,044,527	4,045,758
4,044,416	4,045,022	4,045,589	4,045,484	4,044,533	4,045,762
4,044,422	4,045,026	4,045,612	4,045,488	4,044,569	4,045,768
4,044,437	4,045,027	4,045,616	4,045,502	4,044,577	4,045,787
4,044,472	4,045,029	4,045,620	4,045,582	4,044,592	18 : 4,044,410
4,044,473	4,045,030	4,045,623	4,045,635	4,044,660	4,044,486
4,044,474	4,045,033	4,045,640	4,045,760	4,044,692	4,044,551
4,044,483	4,045,034	4,045,651	4,045,819	4,044,695	4,044,552
4,044,515	4,045,044	4,045,678	10 : 4,044,711	4,044,712	4,044,553
4,044,517	4,045,046	4,045,681	4,045,377	4,044,752	4,044,554
4,044,542	4,045,059	4,045,683	4,045,425	4,044,757	4,044,604
4,044,548	4,045,061	4,045,689	4,045,432	4,044,758	4,044,661
4,044,549	4,045,063	4,045,690	4,045,473	4,044,767	4,044,794
4,044,558	4,045,078	4,045,693	4,045,511	4,044,768	4,044,870
4,044,579	4,045,085	4,045,705	4,045,512	4,044,796	4,044,920
4,044,597	4,045,105	4,045,714	4,045,513	4,044,885	4,044,981
4,044,609	4,045,109	4,045,728	4,045,544	4,044,891	4,045,023
4,044,641	4,045,111	4,045,735	11 : 4,044,583	4,044,946	4,045,039
4,044,643	4,045,121	4,045,737	4,044,932	4,044,947	4,045,062
4,044,648	4,045,122	4,045,749	12 : 4,044,406	4,044,950	4,045,139
4,044,652	4,045,140	4,045,751	4,044,451	4,044,977	4,045,176
4,044,668	4,045,145	4,045,779	4,044,482	4,044,994	4,045,435
4,044,708	4,045,147	4,045,785	4,044,494	4,045,024	4,045,466
4,044,718	4,045,155	4,045,789	4,044,502	4,045,050	4,045,636
4,044,720	4,045,208	4,045,795	4,044,657	4,045,055	4,045,698
4,044,750	4,045,234	4,045,800	4,044,705	4,045,065	4,045,748
4,044,753	4,045,269	4,045,813	4,044,706	4,045,074	4,045,777
4,044,755	4,045,288	4,045,814	4,044,841	4,045,123	19 : 4,044,837
4,044,763	4,045,296	8 : 4,044,617	4,044,957	4,045,136	4,044,999
4,044,772	4,045,302	4,044,756	4,044,986	4,045,232	4,045,021
4,044,784	4,045,313	4,044,799	4,045,066	4,045,243	4,045,082

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56 : 4,044,513

DESIGN PATENTS

1	245,616		245,595		245,642	29	245,555		245,645		245,604
2	245,548		245,609	18	245,549		245,622	30	245,589	48	245,557
4	245,587		245,614		245,633	34	245,560		245,610		245,631
	245,607		245,644	19	245,605		245,569		245,611		245,639
6	245,554	8	245,606	24	245,588		245,602	41	245,624		245,640
	245,556	9	245,570		245,598	36	245,547	42	245,550	49	245,635
	245,559		245,578		245,615		245,565		245,551	51	245,623
	245,563	12	245,617	25	245,576		245,585		245,552	53	245,597
	245,567	17	245,564		245,594		245,586		245,553		245,618
	245,574		245,566		245,643		245,591		245,608		245,620
	245,575		245,579	26	245,596		245,593	44	245,636		245,621
	245,577		245,582		245,632		245,613	47	245,600		245,637
	245,581		245,630	27	245,584		245,626		245,601	55	245,592
	245,590		245,641		245,634						

PLANT PATENTS

6	4,095	39	4,096								

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Juanita M. Kreps, *Secretary*

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